FUNDAÇÃO INSTITUTO CAPIXABA DE PESQUISAS EM

CONTABILIDADE, ECONOMIA E FINANÇAS (FUCAPE)

IVONE GONÇALVES LUIZ

**ESSAYS ON ACCRUALS, ACCOUNTING SYSTEMS AND
DISCLOSURE QUALITY**

VITÓRIA
2015

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A Thesis submitted to Fundação Instituto Capixaba de Pesquisas e Contabilidade, Economia e Finanças (FUCAPE), in partial fulfillment of the requirements for the degree of PhD in Accounting and Business Administration.

Adviser: Prof. Dr. Bruno Funchal

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ESSAYS ON ACCRUALS, ACCOUNTING SYSTEMS AND DISCLOSURE QUALITY

Tese apresentada ao Programa de Doutorado em Ciências Contábeis e Administração de Empresas, da Fundação Instituto Capixaba de Pesquisa em Contabilidade, Economia e Finanças (FUCAPE), como requisito parcial para obtenção do título de Doutor em Ciências Contábeis e Administração de Empresas.

Aprovada em 30 de Janeiro de 2015.

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To my family.

ACKNOWLEDGEMENTS

RESUMO

Esta dissertação estuda as conseqüências da pesquisa sobre qualidade dos lucros e disclosure de informações e como estas afetam a decisão dos investidores e gestores sobre a firma (por exemplo, gerenciamento de accruals, preço da ação). Tanto a qualidade do lucro quanto a divulgação de informações afetam as transações financeiras e contratos da firma (entre usuários interno e externos). No primeiro artigo nós procuramos evidência empírica de que a familiaridade das empresas, por meio da marca, pode atrair certos tipos de investidores, mesmo na presença de menor qualidade divulgação. Para tanto, foi utilizado como proxy de visibilidade o índice Landor para as empresas americanas, entre 2007 e 2011. Os dados foram coletados na base de dados WRDS, nos sites das empresas, e na base EDGAR/SEC. Os resultados sugerem que empresas com alto reconhecimento da marca, mas com menor qualidade divulgação ainda têm um maior número de investidores individuais, melhor liquidez e menor volatilidade dos retornos. Estes resultados indicam que a familiaridade da marca pode ter um efeito maior sobre as decisões de compra de ações por parte de tais investidores. No segundo artigo, foi explorado, por meio de modelagem matemática, a escolha ótima de accruals pelo gestor quando a governança corporativa e o sistema contábil afetam a qualidade do lucro. Eu modelei a decomposição dos lucros em dois componentes, por simplicidade, com reversão de accruals em dois períodos de tempo, $t = 1, 2$. No primeiro período, o gestor seleciona esforço, de acordo com a sua capacidade de viés / reversão dos lucros reportados pela firma, embora a conseqüência sobre a distribuição da probabilidade no primeiro altere a distribuição do segundo período. No segundo período, a escolha do gestor de mais / menos esforço é selecionada o que afeta o segundo componente dos lucros. Finalmente, o terceiro artigo investiga se os fundamentos da firma têm comportamento diferente com a interação do sentimento de mídia na previsão de lucros anormais. Foram coletadas notícias sobre empresa brasileiras, listada na BM&FBovespa, no Wall Street Journal e Valor Econômico no período entre 2008 e 2013. Os resultados indicam que os retornos anormais da firma com cobertura de mídia no quartil superior tiveram menor impacto por meio dos fundamentos da firma. Por outro lado, retornos anormais da firma com cobertura de mídia no quartil inferior tiveram maior impacto por meio dos fundamentos.

Palavras-chave: accruals, qualidade do lucro, disclosure, visibilidade.

ABSTRACT

This dissertation examines the consequences of research on the quality of earnings and disclosure of information and how these affect the decisions of investors and managers about the firm (e.g., management of accruals, pricing of shares). Both earnings quality and information disclosure affect firms' financial transactions and contracts (between internal and external users). In the first essay, I seek empirical evidence that the public familiarity of firms, by means of brand recognition, can attract certain types of investors, even in the presence of lower disclosure quality. For this purpose, I used as a visibility proxy the Landor index for American companies between 2007 and 2011, applied to data obtained from the WRDS database, the firms' sites and the EDGAR/SEC base. The results suggest that firms with higher brand recognition but lower disclosure quality still attract a larger number of retail investors, have better liquidity and less volatile returns. These results indicate that brand familiarity can have a stronger effect on investors' buying decisions than other variables. In the second essay I apply mathematical modeling to select the optimal accrual level when corporate governance and the accounting system affect the quality of earnings. I modeled the decomposition of earnings into two components, for simplicity, with reversal of accruals after two time periods, $t = 1, 2$. In the first period, the manager chooses effort according to his ability to bias/reverse the earnings reported, even though the consequence on the probability distribution in the first period alters the distribution in the second one. In the second period, the manager's choice of more (less) effort affects the second component of earnings. Finally, in the third essay I investigate whether firm fundamentals have different behavior when interacted with media sentiment in predicting abnormal returns. For this purpose, I collected news stories on Brazilian firms listed on the BM&FBovespa in Wall Street Journal and its Brazilian counterpart Valor Econômico, in the period from 2008 to 2013. The results indicate that abnormal returns of firms with media coverage sentiment in the upper quartile have less impact by means of firm fundamentals, while abnormal returns of firms in the lower media sentiment quartile have higher impact by means of fundamentals.

Keywords: accruals, earnings quality, disclosure, visibility.

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1 INTRODUCTION

Accounting information supports assorted demands by numerous users (shareholders and other stakeholders) regarding their relationship with firms. Besides serving for valuation, it affects contracts with lenders and suppliers, shareholder-management and company-employee relations and decisions of regulators (GUTTMAN, 2013). The theoretical and empirical literature indicates that different accounting systems are optimal for assisting the heterogeneous sources of information demand.

Empirical research shows that managers can, and habitually do, bias their accounting reports. Managers ability' to bias the accounting reports is mainly done through discretionary accruals, which is an important aspect of the corporate disclosure environment and has received a good deal of attention in the theoretical and empirical literature on the valuation firms and the roles of accounting information. Drymiotes and Hemmer (2013) view the ability to bias as a key feature of their model and use their setting to study the extent to which commonly used empirical proxies of "earnings quality" capture the effect of changes in accrual strategy on the precision of the inferences about the firms' underlying value that can be made from reported numbers. According to them, managers can affect the distributional properties of the mapping from a firm's output to reported earnings in the first period, while the effect on the distribution in the first period reverses in the second period.

This study focuses on the extensive literature on earnings quality and information disclosure and how it impacts prices (for example, stock prices). Earnings quality has been found to affect financial transactions, i.e., equity offerings and

management payouts (PERRY AND WILLIAMS, 1994). Voluntary information disclosure can also affect investors' decisions. I discuss this point in more detail in Essay 1, where I also look for empirical evidence that firms' familiarity, measured by brand name strength, tends to attract certain types of investors even in the presence of lower disclosure quality. I show that firms with high recognition but with lower disclosure quality still have a larger number of retail investors, better stock liquidity and lower stock return volatility.

In Essay 2, I model decomposition of earnings into two components, for simplicity, and apply a two-time-period reserve accrual model, $t=1, 2$. In the first period, the manager selects effort according to his ability to bias/reverse accruals in the firm's reported earnings, although the consequence of the distribution in the first period reverses in the second period. In the second period, the manager's choice of more/less effort affects the second component of earnings.

Finally, Essay 3 examines if firms' fundamentals have different behavior with the interaction of media coverage sentiment regarding the valuation of firms. I collected news stories on Brazilian firms listed on the BM&FBovespa in Wall Street Journal and its Brazilian counterpart Valor Econômico. The results indicate that abnormal returns of firms with media coverage sentiment in the upper quartile have less impact by means of firm fundamentals, while abnormal returns of firms in the lower media sentiment quartile have higher impact by means of fundamentals.

2 HOW DO VISIBILITY AND DISCLOSURE QUALITY INTERACT TO INFLUENCE STOCK MARKETS?

2.1 INTRODUCTION

This research looks for empirical evidence that firms' familiarity, measured by strong brand name, tends to attract certain types of investors even in the presence of lower disclosure quality. I show that firms with high recognition but with lower disclosure quality still have a larger number of retail investors, better stock liquidity, and lower stock return volatility. These results suggest that familiarity may affect more individual (retail) investors' purchasing decisions of stocks and propensity to hold stocks for a longer period than does disclosure quality. Also, certain types of institutions tend to put more emphasis on disclosure quality over a firm's overall visibility or recognition.

What are the real motivations for voluntary disclosure? Is it intended to inform economic agents in general or just to attract attention from investors? If voluntary disclosure is attention-grabbing activity or showing off how good they are, maybe, the effects of visibility and voluntary disclosure might be similar.

Beyer et al. (2010) suggest that one of the important roles of accounting is to help capital providers such as shareholders evaluate investment opportunities and allocate their capital to the proper place. In theory, Diamond and Verrecchia (1991) and Kim and Verrecchia (1994) argue that voluntary disclosure of accounting information reduces information asymmetries between informed and uninformed investors. Consistent with such predictions, considerable research has provided

evidence that firms with high disclosure quality experience favorable stock market consequences such as better liquidity, lower cost of capital, and more comprehensive institutional and analyst following by mitigating information asymmetries. For example, Farragher et al. (1994) and Lang and Lundholm (1993) find that disclosure scores are negatively associated with analysts' forecast errors and the standard deviation of stock returns. Also, Welker (1995) suggests that disclosure scores are negatively related to bid-ask spreads. Furthermore, Healy et al. (1999) provide evidence that firms that expand disclosure, measured by the AIMR (Association for Investment Management and Research) disclosure rating, experience increased stock liquidity, institutional ownership, analyst following and stock returns. In addition, Leuz and Verrecchia (2000) suggest that firms listed on the Neuer Exchange, which imposes high disclosure requirements, tend to have lower bid-ask spreads than firms listed on the Frankfurt Exchange, which imposes lower disclosure requirements. Bushee and Noe (2000) also examine whether firms with high disclosure rankings tend to attract certain types of institutional investors, thus affecting stock return volatility.

On the other hand, recent finance and accounting studies suggest that high visibility actually brings similar capital market effects as accounting disclosure does. Theoretically, Merton (1987) suggests that cost of capital would go down as more investors recognize the firms' existence. Empirically, Coval and Moskowitz (1999) find that U.S investment managers tend to invest in domestic firms, indicating the existence of a home bias. Huberman (2001) finds that familiar stocks attract more investors. Grullon et al. (2004) also find that more visible firms, measured by higher advertising expenditures, tend to have a larger number of shareholders and better liquidity. In addition, Frieder and Subrahmanyam (2005) find that retail investors tend

to purchase stocks with high recognition due to easily recognized products. Also, Lehavy and Sloan (2008) suggest that firm visibility impacts stock price even more than firm fundamentals. These studies indicate that visibility or familiarity influences investors' decisions to purchase stocks or propensity to hold them, thus affecting stock liquidity and cost of capital.

Considering that visibility and accounting information bring similar capital market outcomes, the question to ask is whether accounting disclosure makes a marginal contribution to firms after controlling for visibility or familiarity. Also, no prior literature investigates whether familiarity can still attract certain types of investors even in the presence of lower disclosure quality or lack of disclosure, which means visibility can replace accounting disclosure in certain settings. Also, it would be interesting to ask whether visibility can substitute accounting disclosure in certain contexts. For example, in the presence of high proprietary information costs, visibility can allow firms to achieve desirable capital market outcomes without incurring the proprietary costs of accounting disclosure. Furthermore, depending on the size or life cycle of a firm, visibility plays a more significant role than accounting disclosure in terms of stock market consequences, and vice versa. If visibility can substitute corporate information environment without sacrificing proprietary information costs, producing beneficial capital market outcomes, this scholarly research can shed light on why firms that suffer from information asymmetries are reluctant to disclose more information out of fear that competitors might obtain their proprietary information. The presence of proprietary information costs might imply that the regulators need to be cautious in terms of imposing mandatory disclosure because this can put firms at a disadvantage. Lastly, I examine whether accounting disclosure and visibility are complementary. This complementary effect will guide firms regarding whether they

also need to exert efforts to achieve investor recognition in addition to accounting disclosure.

To the best of my knowledge, this is the first paper that comprehensively examines how two well-known determinants of voluntary disclosure and visibility impact investor behavior, market liquidity, and cost of capital independently and simultaneously. Bushee and Miller (2012) examine the impact of investor relations (IR) activities, which are viewed as enhancing visibility, on the number of investors, number of analysts, and media coverage, controlling for the disclosure quality, trying to separate the effects of IR from the effects of disclosure. However, that paper does not thoroughly examine how accounting disclosure and visibility deliver unique values to firms individually or whether these two determinants substitute or complement each other. Also, the authors provide a new perspective on whether firms use alternative mechanisms to achieve certain stock market consequences in case accounting disclosure is likely to place firms at a disadvantage. This might suggest a reason why certain firms do not voluntarily disclose information despite the well-known positive effects of voluntary disclosure on the stock markets from a proprietary information cost perspective. In these respects, I investigate the following questions. First, I study whether voluntary disclosure is a value-relevant activity, after controlling for visibility. Second, I investigate whether visibility is a value-relevant activity, after controlling for disclosure quality. Third, I examine whether visibility can replace voluntary disclosure in the presence of proprietary information costs. Lastly, I examine whether a premium exists for firms with high disclosure quality and high visibility.

By exploring a way to separate the effects of disclosure from the effects of visibility in capital market settings or vice versa, this paper intends to increase the overall understanding of the corporate information environment and its consequences in different contexts. Consistent with Lehavy and Sloan (2008), according to whom investors and managers should worry not only about accounting information and related investment fundamentals, but also investor recognition for firm valuation, this paper pays heed to the real decisions on matters like advertising in the accounting information context.

Furthermore, I shed light on proprietary information costs that accounting disclosure might impose unintentionally and that put firms' competitive edge at risk. As a result, this paper gives a better understanding of why some firms maintain low disclosure quality or do not disclose voluntarily from a perspective of proprietary cost and of why this could be the equilibrium in disclosure practices. Also, using a new measure of the proxy for proprietary information costs, this paper also contributes to the proprietary information costs literature. Visibility can complement accounting disclosure and allow firms to achieve desirable capital market consequences.

This paper contributes to the disclosure literature by suggesting that institutional investors put more weight on corporate disclosure practices over visibility (such as strong brand name). This research also contributes to the recent literature (FRIEDER AND SUBRAHMANYAM, 2005) on how visibility influences investors' decision to purchase or hold stocks. In this respect, I find that individual investors' trade based on factors other than accounting fundamentals. Lastly, the combination of brand and accounting disclosure brings different outcomes in stock returns and stock return volatility as well as different capital structure and financing decisions.

The main question is to separate the effects of accounting disclosure from the effects of visibility and also to investigate the existence of substitution ad complementary effects two determinants in capital market settings.

2.2   DESCRIPTION OF DICLOSURE AND VISIBILITY VARIABLES

2.2.1 Voluntary Disclosure

Botosan (1997) developed a measure for voluntary disclosure level by scoring the information items in the annual reports of 122 machining firms for fiscal year 1990. Based on the five categories (background information, historical results, key non-financial statistics, forecast information, and management discussion and analysis), she added the scores for each information content category and ranked the scores to obtain the level of voluntary disclosure. Following Botosan (1997), Francis et al. (2008) built a voluntary disclosure score measure with two modifications. To capture "voluntary" disclosure, they excluded the background information and management discussion and analysis (MD&A) sections, in which the Securities and Exchange Commission (SEC) substantially rules reporting, so that these sections are not necessarily voluntary.

Francis et al. (2008) also added a category of non-GAAP) financial measures such as free cash flows, return on investment (ROI), and residual income to capture more "voluntary" information that Botosan (1997) did not explore. Francis et al. (2008) coded information items separately for each firm's annual report and its 10-K filings using binary variables. For binary information, they assigned one if the firm discloses certain information and zero otherwise. For non-binary information or information that is more continuous in nature, such as the items included in the

historical results category, they counted the number of periods in which the firm discloses the information. In order to convert this non-binary information to binary form, they took the largest of the 10-K or annual report and assigned one if the value was above the median of sample firms and zero otherwise. For a total of 25 information elements, they calculated the firm's raw disclosure score by summing the values which are equally-weighted and scaled this raw score to assign a percentage-based score for each firm.

Loughran and Mcdonald (2011) developed a new dictionary of negative words to categorize the text of the reports 10-K during 1994-2008, as an alternative to a metric of textual analysis.

I use this voluntary disclosure measure of Francis et al. (2008) for two reasons. First, Healy and Palepu (2001) indicate that self-constructed measures better capture what they are supposed to capture compared to externally generated scores. Also, self-constructed measures are not vulnerable to large-firm selection bias, a problem that externally generated scores generally suffer. Second, their results based on this measure are not sensitive to different ways of scoring the voluntary disclosure, which they tested in several different ways. Although self-constructed measures are subjective and hard to replicate, I assume these measures are relatively good at capturing voluntary disclosure level (NAGAR ET AL 2003).

Also, for disclosure quality, following Botosan (1997), I develop a measure using the number of analysts following the firm and providing one-year earnings forecasts (Thomson Reuters database) and voluntary forecast disclosure (from

SEC/EDGAR 10-K fillings)[1]. According to Francis at al. (2008), disclosures in firms' annual reports and 10-K filings are reasonably stable from one year to the next, so they are likely subject to less discretion than is, e.g., the decision to issue a management forecast.

2.2.2 Visibility

Following Grullon et al. (2004), I use advertising expenses as a proxy for visibility. Considerable research in the economics literature has investigated the role of advertising in product market competition. Telser (1966) and Nelson (1974) studied the information role of advertising on consumers. Economic studies such as Kihlstrom and Riordan (1984), Milgrom and Roberts (1986), Milgrom (1981) focused on how advertising conveys information through signaling. On the other hand, Robinson (1933), Stigler and Becker (1977) and Becker and Murphy (1993) indicated that firms enhances market power by differentiating their products, creating brand loyalty and raising entry barriers through advertising. In both currents of research, advertising influences the information environment one way or the other. According Aerts (1994) visibility and public evaluation (i.e. quotation on the stock exchange) increase audience size and may increase the company's awareness of their public image and hence can encourage verbal impression management behavior.

Another form of the firm's visibility is in the brand. Belo et al (2013), assume that brand as a factor of production in operating profit function as it assists the firm to increase sales through the visibility. Support by discussion of Merton (1987) and Belo

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[1] According to Bochner and Clark (2008, p. 3) the "SEC's principal disclosure requirement with respect to financial analysis is Management's Discussion and Analysis of Financial Condition and Results of Operations (MD&A), set forth in Item 303 of Regulation S-K. The MD&A is a critical part of every annual (Form 10-K) and quarterly (Form 10-Q) report."

et al (2013, p. 8) "if some investors suffer from limited attention and other forms of behavioral biases informing expectations, increased advertising expenditures can cause higher contemporaneous stock returns but lower subsequent returns". This is because advertising increases the buying pressure by increasing the visibility of the shares of the firm without changing the pressure on the supply side. Also, as potential data sources for brand perceptions, used as other proxy for visibility, I started with the brand survey data of Landor Associates[2], which is considered one of the world's leading brand consultancies, following Frieder and Subrahmanyam (2005). Each year Landor Associates studies around 2,500 brands in the Young & Rubicam Group database "identifying those brands that exhibited the greatest increases in brand strength. Growth in brand strength indicates how much the brand's raw strength score has risen over the past three years, expressed in percentage terms" (Landor, 2014, p. 20).

2.3   HYPOTHESIS

For the first question, regarding whether accounting disclosure is value-relevant or delivers unique value even after separating visibility effects, I establish the first hypothesis as follows. For visibility, I use brand perception as a proxy. Kalay (2012) finds that sophisticated information processors prefer firms with more voluntary disclosure such as earnings guidance and less sophisticated investors focus on firms with press dissemination and investor relations activities. Following Bushee and Noe (2000), as a proxy for sophisticated information processors I use

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[2] The Landor data have previously been used in the marketing literature; for example. Lane and Jacobson (1995) used them to explore the effect of brand extension announcements on stock returns. "Landor Associates is one of the world's leading strategic brand consulting and design firms. Each year the stories behind the Top 10 most successful brands in Landor's annual Breakaway Brands study, as featured at Forbes online, are as surprising as they are varied." (Landor, 2013, p. 120).

the number of institutional investors and predict that institutional investors are likely to benefit from the value that accounting creates more so than individual investors. Therefore, the first hypothesis is as follows.

H_1: Firms with less visibility and a high disclosure quality tend to have a higher proportion of institutional investors.

Second, I examine whether visibility can attract certain types of investors even in the presence of lower disclosure quality. Consistent with Bushee and Noe (2000), individual investors, who are generally considered less sophisticated investors or noise traders, are likely to be attracted to such firms. Therefore, I examine the following pair of hypotheses.

$H_{2(A)}$: Firms with greater visibility and a lower quality of disclosure tend to have a higher proportion of individual investors.

$H_{2(B)}$: Firms with more visible stocks tend to have lower stock return volatility through long-term individual investors than firms with less visible stocks, controlling for disclosure quality.

Third, I examine whether visibility and accounting disclosure are substitutes or complements. I study whether visibility can substitute accounting disclosure in the presence of high proprietary information costs. Berger (2011) suggests that the literature uses measure of product market competition as a proxy for proprietary information costs. Using existing measure of concentration as a proxy for proprietary costs, the lower the concentration is, indicating a more competitive market, the higher proprietary information costs are. That is, more competitive industries are viewed as having higher proprietary costs and visibility can generate positive stock market

consequences by substituting the role of accounting disclosure, which is likely to cause firms to incur proprietary information costs. Therefore, firms that sell consumer products which are likely to experience stronger competition from rivals) might have fewer incentives to maintain high quality disclosure. If the alternative mechanism is available for firms to achieve similar capital market effects and still avoid incurring proprietary costs, these firms are less likely to voluntarily disclose information such as earnings guidance or forecasts. Therefore, I presume that more competitive industries are more likely to have stronger brand visibility but do not seem to have high disclosure quality at the same time. Consequently, the third hypothesis is as follows:

H$_3$: Visibility is negatively associated with corporate disclosure quality, suggesting that visibility substitutes disclosure.

2.4   HYPOTHESIS REGRESSION MODELS

I use multivariate regression analysis to examine the impact of accounting disclosure on the breadth of ownership, in terms of number of shareholders and number of institutional investors. To control for brand perceptions, I form a matched sample of control firms that do not maintain high disclosure quality. There are five dependent variables (number of investors, number of individual investors, number of institutional investors, bid-ask spreads, and stock return volatility) that influence cost of capital. Following Kang and Stulz (1997) and Coval and Moskowitz (1999), I use return on assets as a proxy for a firm's profitability and leverage as a proxy for the likelihood of financial distress. Kang and Stulz (1997) and Coval and Moskowitz (1999) showed different results, but both sets of authors view ROA and leverage as

determinants of institutional holdings. Also, following Frieder and Subrahmanyam (2005), I include firm size as a control variable for institutional holdings because institutions tend to prefer large firms to avoid speculative stock prices, to which small firms are more vulnerable. Also, firm size mitigates liquidity concerns.

I estimate the following multivariate regression model to account for the effect of the interaction between visibility and disclosure on the total number of investors, while controlling for other factors that may affect the breadth of investors:

$$\textit{Number of Individual Investors} = \beta_0 + \beta_1 DISC_{it} + \beta_2 VISIBILITY_{it} + \beta_3 DISC_{it} * VISIBILITY_{it} + \beta_4 X_t + \epsilon_{it,} \tag{1}$$

$$\textit{Number of Institutional Investors} = \beta_0 + \beta_1 DISC_{it} + \beta_2 VISIBILITY_{it} + \beta_3 DISC_{it} * VISIBILITY_{it} + \beta_4 X_{it} + \epsilon_{it,} \tag{2}$$

$$\textit{Bid-Ask Spreads} = \beta_0 + \beta_1 DISC_{it} + \beta_2 VISIBILITY_{it} + \beta_3 DISC_{it} * VISIBILITY_{it} + \beta_4 X_{it} + \epsilon_{it,} \tag{3}$$

$$\textit{Stock Return Volatility} = \beta_0 + \beta_1 DISC_{it} + \beta_2 VISIBILITY_{it} + \beta_3 DISC_{it} * VISIBILITY_{it} + \beta_4 X_{it} + \epsilon_{it,} \tag{4}$$

where $DISC_{it}$ is the disclosure quality, $VISIBILITY_{it}$ is the visibility of brand, and X_{it} are control variables that might affect investor profile for all firm i in t.

Following Grullon et al. (2004), I use the following explanatory variables, which are considered to be associated with advertising expenses: firm age, market value of equity, total assets, return on assets, average monthly stock return, share price, and return volatility. Also for the breadth of ownership, I use number of shareholders (1000s) and number of institutional shareholders. For liquidity measures, I use quoted bid-ask spread, and average monthly share volume (in millions). I use bid-ask

spreads to examine the impact of disclosure on liquidity, after controlling for brand perceptions, which measure the level of visibility.

2.5   POTENTIAL PROBLEMS AND LIMITATIONS

However, there is conflicting evidence regarding disclosure quality and institutional ownership. Bushee and Noe (2000) find that the higher disclosure rankings are, the greater the number of investors is, increasing stock return volatility. On the other hand, Ramalingegowda and Yu (2011) suggest that institutional ownership leads to more conservative reporting. Therefore, there is no consensus on the direction of causality between disclosure quality and investor profile. However, it may also be that the difference between conservative reporting and high disclosure quality led to different outcomes in those papers as well. Basu (1997) indicates that conservatism more often involves recognizing good news as gains than recognizing bad news as losses.

The association between strong visibility and disclosure quality with number of investors might be endogenous. For example, firms that sell consumer products tend to be more avidly followed by individual investors and also spend more money on strong visibility, measured by advertising expenditures, bringing more individual investors. Also, individual investors might prefer stocks of firms whose stock return volatility is high but those firms might tend to have certain characteristics that lead to lower disclosure qualities. If certain firms prefer to have individual investors, that might cause them to invest more in advertising. Lastly, there is a limitation on the visibility and disclosure quality measures.

2.6   EMPIRICAL FINDINGS

The sample, following the criteria in Table 1 (and Appendix A), is composed by all firms with observations available through Wharton Research Data Services (WRDS)[3], to enable estimating the proxies for visibility as well as disclosure, in the period from 2007 to 2011 (880 firms). I excluded of the sample firm-year observations with SIC codes from 6000 to 6999 (financial firms) because the disclosure requirements and accounting rules are considerably different for these firms. I use as proxies for visibility the fact of being listed in the Landor Associates brand survey database and BVA Advertising database. In particular, I employ the Landor Image Power Survey database, because Landor is regarded as one of the world's leading branding consultancies. These data were collected from 2007 to 2011 through a consumer survey and offer different attributes of brand recognition. Brand quality perception is taken by a variable called RLANDOR. I relate the measures of brand perceptions to visibility of the company's brand.

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[3]   To combine the Compustat/ IBES/ CRSP databases, I used SAS code, available at http://wrds-web.wharton.upenn.edu/wrds/research/macros/sas_macros/iclink.sas.

TABLE 1: SAMPLE SELECTION CRITERIA (N. OF OBS.)

Data available in Compustat - firms in the same sector of firms in Landor's raking	57,623
(-) Return on assets not available or equal to zero	(11,735)
= Firms in the same sector of firms in Landor's raking	45,888
(-) No Landor ranking available categorized by diferent SIC	(42,299)
(+) Same SIC firms listed in Landor's ranking	1,070
Total observations	4,659

Source: Author.

To control for visibility and disclosure, I include proxies according to Table 2:

TABLE 2: DATA SOURCES OF VARIABLES

Database	Description of Variable
Compustat	▪ Advertising expenses ▪ Share price ▪ Operating income before depreciation ▪ Number of common shareholders ▪ Leverage (measured as debt-to-assets)
Center for Research in Securities Prices (CRSP)	▪ Return volatility (standard deviation of daily returns over the year) ▪ Bid-ask spread ▪ Firm age[4]
Thomson Reuters Spectrum (13F)[5]	▪ Number of institutional investors, and number of shares

continued

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[4] Firm age (years) is constructed as the number of years the firm has existed in the CRSP / Compustat database, and IPO/founding dates are constructed by Ritter et al (2004), available at http://bear.warrington.ufl.edu/ritter/FoundingDates.htm, "This dataset contains the founding dates, CRSP permanent IDs, the first day of trading on CRSP, and the company names for 9,597 (updated May 2013) firms that went public in the U.S. during 1975-2013, almost all of which were subsequently listed on CRSP" (Ritter and Loughran, 2004, p.20).

[5] The sample of institutional investors only included those with investments larger than $ 100 thousand, according to Rule 13f-1(a) from the SEC: "Every manager that exercises investment discretion with respect to accounts holding Section 13(f) securities, as defined in rule 13f-1(c), having an aggregate fair market value on the last trading day of any month of any calendar year of at least $100,000,000." (Report of Institutional Investment Managers Pursuant to Section 13(f) of the Securities Exchange Act of 1934). After the April 1, 1999, all 13F forms were required to be submitted by institutional investment managers through use of the SEC's Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system.

Database	Description
Institutional Brokers' Estimate System (I/B/E/S)	▪ Number of analysts providing one-year earnings forecast
Electronic Data Gathering, Analysis, and Retrieval (EDGAR / SEC)	▪ FOG 10-K (Fog Index on readability of MD&A)

Source: Author.

Table 3 shows the descriptive statistics for the sample and Table 4 shows the Pearson (upper triangle) and Spearman (lower triangle) correlations.

TABLE 3: SUMMARY STATISTIC

The table reports the mean, standard deviation, minimum and maximum and number of observations for the variables in the subsequent analyses. I use all firms from the Center for Research in Security Prices (CRSP) files, Industrial Compustat and Institutional Brokers' Estimate System (I/B/E/S) with common stocks traded between 2007 and 2011. To be included in the sample, the variables need satisfy the following definition on database. Variables are collected from Compustat: *AT* (total asset), *SHO* (number of shares outstanding), *SPR* (share price), *ROA* (return on asset is calculated as operating income before depreciation over total asset), *LEV* (ratio of total debt to asset are calculate as Long-Term Debt plus Debt in Current Liabilities over total asset), *SALES*, *CAPEX*, *TQ* (Tobin's Q), *MVE* (market value of equity is equal to the number of shares outstanding multiplied by the share price), *XAD* (Advertising). Variables are collected from CRSP: *BA* (bid-asks spread for year t), *RETV* (Return Volatility). Number of institutional investor (from Thomson Spectrum). The variables included number of analysts providing one-year earnings forecast.   After the April 1, 1999 compliance date, all 13F forms were required to be submitted by institutional investment managers through use of the Commission's Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system.

Market & firm characteristics	Mean	Std. Dev	Min	Max	No. Obs
AT = Total assets ($ million)	12,933.48	46,159.51	2.72	797,769.00	4,659
SHO = Number of Shares Outstanding (millions of shares)	608,744.70	2,619,605.00	0.00	53,127,598	3,538
SPR = Share Price ($)	337.51	905.81	0.00	11450.00	4,659
ROA = Return on Asset	-0.33	3.59	0.01	4.43	4,659
LEVERAGE = Leverage (measured as debt-to-assets)	0.21	1.01	0.00	43.18	4,659
SALES = Sales (sales per share $ million)	23.14	158.02	0.61	4,729.96	4,583
CAPEX = Capital expenditures per share	1.56	17.93	-17.70	754.52	4,583
TQ = Tobin's Q	7.55	160.41	0.00	10,511.50	4,659
MVE = Market Value of Equity ($ million)	10,858.83	34,398.87	0.00	504,239.60	4,659
AGE = Firm age (years)	20.34	17.88	1.00	111.00	4,634
Investor characteristics					
NUMINSTOWNERS = N°. of institutional shareholders (13-F)	195.16	285.46	1.00	1,725.00	3,538

Market & firm characteristics	Mean	Std. Dev	Min	Max	No. Obs
INSTOWNPERC = Total Institutional Ownership (13F), % of Shares Outstanding	0.50	0.43	0.00	9.02	3,538
CSHR = No. of Common Shareholders	27.89	145.10	0.00	2311	4,659
CSHRPER= % Total Common Shareholders	0.61	0.43	0.02	1	4,659
Liquidity					
BIDASK = Bid-ask Spread	3.15	1.54	-6.73	1.48	4,659
RETV = Return Volatility	0.03	0.01	0.00	0.09	3,705
Disclosure					
FOG10K (Fog Index on readability of MD&A)	2.11	5.91	0	69	4,659
Visibility					
XAD = Advertising expenses ($ million)	143.63	663.76	0	9315	4,659
FLWALYS = Number of analysts following the firm (#)	13.97	24.38	0	232	4,659
Dummy DLY = Year indicator variable RLANDOR	Yes				

Source: Author.

TABLE 4: PEARSON (UPPER TRIANGUILE) AND SPEARMAN (LOWER TRIANGUILE) CORRELATIONS

Variable	AT	SHO	SPR	ROA	LEV	SALES	CAPEX	TQ	MVE	AGE	BA	RETV	NINT	PINST	PIND	XAD	NANL	FOG10K
AT	1	0.8370*	0.7507*	0.5183*	0.5139*	0.7483*	0.7824*	-0.2364*	0.9410*	0.3787*	-0.7387*	-0.6687*	0.2590*	0.2590*	0.2591*	0.3014*	0.2784*	-0.0098
SHO	0.7910*	1	0.4791*	0.3410*	0.4030*	0.3714*	0.4673*	0.0147	0.8673*	0.3153*	0.6414*	0.5130*	0.2409*	0.1428*	0.1427*	0.2051*	0.2684*	-0.0415
SPR	0.0928*	0.0531*	1	0.5507*	0.3008*	0.7177*	0.7069*	0.1387*	0.8284*	0.3027*	0.6911*	0.6917*	0.2166*	0.3779*	0.3781*	0.2254*	0.2989*	0.0128
ROA	0.0948*	0.1248*	0.0975*	1	0.2374*	0.5823*	0.5113*	0.022	0.5155*	0.2860*	0.4075*	-0.4907*	0.1806*	0.1349*	-0.1348*	0.3134*	0.1718*	-0.0109
LEVERAGE	0.0650*	0.0579*	-0.0137	0.0004	1	0.4320*	0.4891*	-0.1787*	0.4167*	0.1996*	0.3337*	-0.3036*	0.1163*	0.1405*	-0.1402*	0.1144*	0.0749*	0.0241
SALES	0.0677*	0.0138	0.9278*	0.0461*	-0.0007	1	0.8538*	-0.4105*	0.6261*	0.3771*	0.5191*	0.5472*	0.1683*	0.1802*	0.1802*	0.3246*	0.1352*	0.007
CAPEX	0.1933*	0.0791*	0.8229*	0.0766*	0.0501*	0.8602*	1	-0.3358*	0.6811*	0.3062*	0.5458*	0.5634*	0.2008*	0.1520*	0.1517*	0.2523*	0.1494*	0.0197
TQ	-0.1475*	-0.1034*	0.0103	-0.3679*	0.0036	-0.0760*	-0.1113*	1	-0.0611*	-0.1321*	-0.0435	-0.0012	0.022	-0.1744*	-0.1742*	-0.0992*	-0.1859*	-0.006
MVE	0.7719*	0.7970*	0.1683*	0.1411*	0.0207	0.0540*	0.1642*	-0.0747*	1	0.3468*	0.7685*	0.6915*	0.2680*	0.3066*	0.3065*	0.2586*	0.3358*	-0.0117
AGE	0.2691*	0.2783*	0.1441*	0.1774*	0.0999*	0.1131*	0.1164*	0.1418*	0.3160*	1	0.3330*	0.3685*	0.0979*	0.1937*	0.1938*	0.1955*	0.1691*	-0.0374
BIDASK	-0.1200*	-0.1554*	0.0895*	-0.1925*	0.1401*	-0.0288	0.0594*	0.0463*	-0.1571*	-0.1571*	1	0.5908*	0.2376*	-0.4196*	-0.4195*	0.2285*	0.3666*	-0.0033
RETV	-0.2079*	-0.2486*	-0.1502*	-0.2778*	-0.0892*	-0.0576*	-0.1060*	-0.0747*	-0.2780*	-0.2805*	-0.3838*	1	-0.3241*	-0.2532*	-0.2531*	-0.2680*	-0.2114*	0.0036
NINT	0.4107*	0.4198*	0.0902*	0.1175*	0.0639*	0.0305	0.0759*	-0.0392*	0.4629*	0.3440*	-0.1501*	-0.2588*	1	0.1281*	-0.1278*	0.0754*	0.1640*	-0.0099
PINST	0.0986*	0.0549*	0.0323	0.1498*	0.0911*	-0.0306	0.0485*	0.0151	-0.0789*	0.1668*	0.3538*	0.2407*	0.1280*	1	1.0000*	0.0707*	0.3572*	0.0552
PIND	0.1471*	0.0858*	0.0370*	0.1694*	0.1011*	0.0363*	0.0639*	-0.0239	0.1003*	0.1991*	0.4042*	0.2679*	0.1224*	0.8838*	1	0.0705*	0.3570*	-0.0551
XAD	0.4032*	0.4443*	0.0633*	0.0807*	0.0450*	0.035	0.0648*	-0.0807*	0.4311*	0.3063*	0.1162*	-0.1751*	0.3140*	0.001	0.0194	1	0.0988*	-0.0234
FLWALYS	0.1331*	0.2230*	0.1086*	0.1434*	0.0274	-0.0019	0.0076	0.0395*	0.2661*	0.2462*	0.2240*	-0.2000*	0.2768*	0.2782*	-0.3129*	0.1272*	1	0.0044
FOG10K	-0.0266	0.0417*	-0.0219	-0.0241	0.0113	-0.0104	-0.0089	-0.001	0.0447*	0.0502*	0.0255	0.0329	-0.0471*	0.0114	0.0271	-0.014	0.0432*	1

* Coefficient is statistically significant at the 0.01 level.

Tables 5 and 6 show the effect of advertising and disclosure on the breadth of ownership.

In this section I examine if investors are more likely to purchase stocks of firms with high levels advertising expenditures and high FOG Index, by cross-sectional test of firms' advertising will be related to firms' total number of individual investors and the number of institutional owners. I use total advertising to assets or to sales since the various parametrized measures do not estimate the *scope* of adverting. According Grullon et al. (2004), General Motors (GM), one of the largest advertisers in the USA, spent $ 3.7 billion on adverting in 2008. While this number represented less 3% of its sales, GM certainly increased the visibility from its advertising campaigns. However, Audible Inc. spent $ 0.3 million on adverting in 2008, but this amount represents more than 82% of its sales revenue.

I apply multivariate regression to analyze the contemporaneous relation of advertising expenditures, FOG Index and number of total shareholders and institutional shareholders. To control for any confounding effects, I use a variety of control variables in the multivariate regressions.

I expect the number of shareholders to be more influenced by size, i.e., not simply are larger firms more probable to have more analyst coverage and greater press coverage, they may only have more shares offered to buy. Thus, I include market value of equity as a variable to neutralize size effects. Furthermore, I use stock price performance (stock returns) and return on assets (ROA) as control variables to capture the investors are more attracted to firms that are doing well.

Firm age and Return volatility are used as proxies for differences in risk on sample. Finally, I include annual dummy variables to capture any systematic change in the variables the effect of business cycle and inflation.

Since I use pooled cross-sectional times-series data in the estimations, the assumptions of the ordinary least squares (OLS) model are likely to be violated[6].

In Table 5, the estimated coefficient of Visibility (XAD) Landor Index and followers analysts are significantly positive in sample, respectively (correlation coefficient = 0.112; p-value < 0.05; correlation coefficient = 0.625; p-value < 0.05). A much smaller coefficient (0.0317) in the lower quartile indicates smaller market reactions given the same abnormal earnings and other firm characteristics. My empirical result does not support the hypothesis H_1; institutional investors tend to purchase stocks of firms with higher disclosure quality in the presence of low visibility than are individual investors. Is this case, the proxy of Disclosure (FOG10K) is not significant on sample.

TABLE 5: EFFECT OF VISIBILITY AND DISCLOSURE: INSTITUTIONAL SHAREHOLDERS

	Predicted Sign		Independent Variable
			N°. of Institutional Investors (13F)
Intercept		Coefficient	314.588
		t-stat	29.200
		Prob	0.000
Disclosure			
FOG-10K	+	Coefficient	0.105
		t-stat	0.150
		Prob	0.548
Visibility			
XAD	-	Coefficient	0.112
		t-stat	2.560
		Prob	0.029*
ANALYSTS	+	Coefficient	0.625
		t-stat	0.970
		Prob	0.032*
Landor 2008	-	Coefficient	4.113
		t-stat	0.650
		Prob	0.016
Landor 2009	-	Coefficient	8.683
		t-stat	3.160
		Prob	0.002

continued

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[6] The numbers of institutional and individual investor, disclosure and visibility variables are winsorized at the top and bottom 1% to reduce the impact of outliers.).

	Predicted Sign		Independent Variable
			N°. of Institutional Investors (13F)
Landor 2010	-	Coefficient	3.018
		t-stat	6.620
		Prob	0.020
L2011	-	Coefficient	6.592
		t-stat	8.470
		Prob	0.002
Disclosure* Visibility			
XAD*	+	Coefficient	0.010
FOG10K*		t-stat	0.029
FLWALYS*		Prob	0.131
Market & firm characteristics			
ROA	+	Coefficient	3.801
		t-stat	2.210
		Prob	0.027*
LEVERAGE	-	Coefficient	1.636
		t-stat	1.510
		Prob	0.031*
CAPEX	+	Coefficient	0.928
		t-stat	2.610
		Prob	0.009*
SALES	+	Coefficient	-0.013
		t-stat	-0.620
		Prob	0.032*
TQ	+	Coefficient	0.922
		t-stat	3.120
		Prob	0.002*
MVE	+	Coefficient	0.001
		t-stat	17.670
		Prob	0.002*
RETV	-	Coefficient	5.802
		t-stat	0.110
		Prob	0.916
BIDASK	-	Coefficient	6.986
		t-stat	3.960
		Prob	0.045*
AGE	+	Coefficient	4.484
		t-stat	9.590
		Prob	0.010*
			R^2: within = 0.2073
			N = 3116

* Significantly different from zero at the 5% level.
Source: Author.

There is the evidence that investors show tendency for investments in firms with more visibility, analyzing a firm's visibility through market advertising as a measure familiarity. According to Grullon et al. (2004, p. 450) "the fact that advertising has a greater effect on common shareholders than on institutional investors suggests that individual investors are more likely than professional

investors to rely on such nonfinancial criteria as familiarity to pick stocks." In Table 6, the results support $H_{2(A)}$, that the individual investors are more likely to purchase more visible stocks than are institutional investors even in the presence of lower disclosure quality. The estimated coefficient of (XAD) (correlation coefficient = 0.910; p-value < 0.05); (FLWALYS) (correlation coefficient = 0.184; p-value < 0.05); (FOG10K) (correlation coefficient = 0.092; p-value < 0.05) are significantly positive in sample within percent of number of Individual Investor) as independent variable.

TABLE 6: EFFECT OF VISIBILITY AND DISCLOSURE: COMMON SHAREHOLDERS

	Predicted Sign		Independent Variables	
			(Total Holders of Outstanding Common Shares	(% N^o. of Individual Investor)
Intercept		Coefficient	0.503	-1.419
		t-stat	4.870	-6.420
		Prob	0.000*	0.000
Disclosure				
FOG10K	-	Coefficient	-0.000	0.092
		t-stat	-0.040	0.820
		Prob	0.966	0.015*
Visibility				
XAD	+	Coefficient	-0.000	0.910
		t-stat	-0.670	7.450
		Prob	0.503	0.0102*
FLWALYS	+	Coefficient	-0.000	0.184
		t-stat	-0.200	1.280
		Prob	0.839	0.200
L2008	+	Coefficient	-0.018	0.174
		t-stat	-1.450	1.190
		Prob	0.1480	0.234
L2009	+	Coefficient	-0.030	0.399
		t-stat	-2.400	2.810
		Prob	0.017*	0.005*
L2010	+	Coefficient	-0.050*	0.280
		t-stat	-3.520	1.830
		Prob	0.000*	0.067*
L2011	+	Coefficient	-0.022	-0.438
		t-stat	-0.780	-2.810
		Prob	0.435	0.005
Disclosure* Visibility				
XAD* FOG10K* FLWALYS*	+	Coefficient	-0.000	0.003
		t-stat	-0.389	1.092
		Prob	0.929	0.879

	Predicted Sign		Independent Variables	
			(Total Holders of Outstanding Common Shares	(% N°. of Individual Investor)
Market & firm characteristics				
ROA	-	Coefficient	-0.003	-0.028
		t-stat	-0.900	-0.870
		Prob	0.370	0.382
LEVERAGE	-	Coefficient	-0.000	-0.025
		t-stat	-0.350	-1.110
		Prob	0.725	0.267
CAPEX		Coefficient	-0.001	-0.000
		t-stat	-1.280	-0.130
		Prob	0.200	0.899
SALES	+	Coefficient	-0.000	0.000
		t-stat	-0.330	0.220
		Prob	0.742	0.824
TQ	+	Coefficient	0.000	-0.019
		t-stat	0.150	-3.220
		Prob	0.882	0.001*
MVE	-	Coefficient	0.000	0.000
		t-stat	-1.370	6.970
		Prob	0.171	0.000*
RETV	-	Coefficient	0.527	0.000
		t-stat	2.050	6.970
		Prob	0.0410*	0.000
BIDASK	-	Coefficient	0.12622	-0.180393
		t-stat	4.530	-1.000
		Prob	0.0000*	0.319
AGE	+	Coefficient	0.00065	0.064046
		t-stat	0.150	6.620
		Prob	0.8790	0.000
			R^2: within = 0.0066 N = 3693	R^2: within = 0.2073 N = 3693

* Significantly different from zero at the 5% level.
Source: Author.

In Table 7, I use bid-ask spreads to examine the impact of disclosure on liquidity, after controlling for brand perceptions, which measure the level of visibility. Combining brand and accounting disclosure I look for different outcomes in stock returns and stock return volatility as well as different capital structure and financing decisions.

The results indicate that firms with strong brand names will experience lower stock return volatility in the presence of low quality disclosure. Other words, it

suggests that when strong brand name does not replace accounting disclosure, either one tends to complement accounting disclosure in terms of reducing stock return volatility. However the results not support the assumption and the premise of H_3 hypothesis.

TABLE 7: EFFECT OF VISIBILITY AND DISCLOSURE ON LIQUIDITY

	Predicted Sign		Independent Variable	
			Bid-ask Spread	Return Volatility
Intercept		Coefficient	-5.648	-3.0501
		t-stat	-29.790	-37.4800
		Prob	0.000	0.0000
Disclosure				
FOG10K	+	Coefficient	-0.007	0.0029
		t-stat	-1.930	1.7400
		Prob	0.054	0.0820
Visibility				
XAD	-	Coefficient	0.000	-0.0001
		t-stat	1.050	-2.0100
		Prob	0.293	0.0450
FLWALYS	+	Coefficient	0.005	0.0022
		t-stat	4.060	3.8200
		Prob	0.291	0.0000
L2008	+	Coefficient	-0.174	0.5785
		t-stat	-2.810	13.4700
		Prob	0.005	0.0000
L2009	+	Coefficient	0.276	0.2145
		t-stat	4.440	5.7300
		Prob	0.000	0.0000
L2010	+	Coefficient	0.454	-0.1298
		t-stat	4.500	-3.4300
		Prob	0.000	0.0010
L2011	+	Coefficient	0.155	0.0048
		t-stat	1.140	0.1200
		Prob	0.254	0.9040
XAD* FOG10K* FLWALYS*		Coefficient	0.000	-0.0001
		t-stat	1.050	-2.0100
		Prob	0.293	0.0450
Market & firm characteristics				
ROA	+	Coefficient	-0.001	0.0280
		t-stat	-0.360	1.4800
		Prob	0.719	0.1400
LEVERAGE	-	Coefficient	0.012	0.0029
		t-stat	2.490	0.4300
		Prob	0.013	0.6700
CAPEX	+	Coefficient	-0.00102	-0.0067
		t-stat	-0.68000	-1.2600
		Prob	0.49500	0.2090

continued

	Predicted Sign		Independent Variable	
			Bid-ask Spread	Return Volatility
Disclosure* Visibility				
SALES	+	Coefficient	0.00014	-0.0001
		t-stat	0.64000	-0.6700
		Prob	0.52300	0.5050
TQ	+	Coefficient	0.00003	0.0013
		t-stat	2.86000	0.4100
		Prob	0.00400	0.6840
MVE	+	Coefficient	0.00003	0.0000
		t-stat	2.86000	3.7800
		Prob	0.00400	0.0000
AGE	+	Coefficient	0.11954	-0.0209
		t-stat	13.01000	-5.4300
		Prob	0.00000	0.0000
			R^2: within = 0.1255 N = 4557	R^2: within = 0.0489 N = 3693

* Significantly different from zero at the 5% level.
Source: Author.

2.7 CONCLUSION

The findings of my research are that individual investors are likely to purchase and hold stocks for a longer period even in the presence of lower disclosure rankings or lack of voluntary disclosure. However, overall institutional investors are not likely to purchase or hold stocks for a longer period if disclosure quality is low and there is low voluntary disclosure. However, depending on the type of institutional investor, the stock purchasing behavior and propensity to hold certain stocks might be different. For example, some institutional investors are not likely to purchase stocks of firms with lower disclosure rankings, as found by Bushee and Noe (2000), conditional on the presence of strong brand name and geographic proximity, but institutional investors might be more likely to purchase strong brand stocks and geographic proximity stocks because they have more time to evaluate the performance of these firms in greater depth. Therefore, the outcome regarding the stock return volatility will be opposite that found by Bushee and Noe (2000) that stock return volatility

increases with increased holding by institutional investors in the presence of high quality disclosure. My results indicate that firms with strong brand names or firms with local equity preference will experience lower stock return volatility in the presence of low quality disclosure. This at least suggests that when strong brand name does not replace accounting disclosure, either one tends to complement accounting disclosure in terms of reducing stock return volatility.

3 HOW CORPORATE GOVERNANCE AFFECTS THE DISTRIBUTION OF ACCRUALS?

3.1 INTRODUCTION

A number of empirical studies have found a positive relationship between the manipulation of accounting earnings (e.g., discretionary accruals) and incentive compensation. Bergstresser and Philippon (2006) reported empirical evidence that firms with high manipulation earnings tend to have more incentive payment in cross section and that periods with high level of accruals coincide with abnormal manager option exercise as well as stock sale volumes. Also, Banker et al. (2009) showed that earnings and cash flows are useful both for firm valuation and performance evaluation of managers. Value relevance of earnings describes a significant amount of the variation in the earnings pay-sensitivity and the additional value relevance of cash flows explains variation in the pay-sensitivity of cash flows. According to theoretical literature from Lambert (1984), Dye (1998) and Fudenberg and Tirole (1995), contracts with managers that maximize pay based on shareholder profits induce managers to smooth earnings. Other theoretical results indicate there are compensation systems where managers will try to hit the earnings target through earnings management, if possible (HEALY 1985; BURNS AND KEDIA, 2006). However, if earnings management is not enough to raise reported earnings to the target, managers will look to maximize current disclosed expenses in order to obtain additional discretion to increase future earnings.

In this study I examine a manager's optimal accrual choice when the current accounting system and corporate governance can affect earnings quality. I look for

how a non-neutral accounting system and weak corporate governance affect the probability of accrual manipulation and the manager's effort to report low earnings.

I investigate, in equilibrium, as the managerial compensation changes, through the accruals choice, can becomes more difficult with the interaction of a proxy for stricter accounting standards, for example, corporate governance mechanisms. Although one can imagine that mitigating earnings management through corporate governance prevent inflating the payment managers, my analysis seeks to show that the equilibrium level of compensation increase manager as accruals manipulation becomes more difficult. Although the manager's income over periods to maximize his bonus. The manager rationally anticipates manager of earnings manipulation strategy and reduces the fixed remuneration. On balance, therefore, the manager is compensated only for risk bearing and its personal cost of inducing effort. When manipulation of results becomes more difficult, the ideal contract induces more effort manager, who, in turn, requires a greater level of managerial remuneration.

Once the equilibrium level of accruals choice decreases the cost of handling, the above result provides a negative association between the management's remuneration and choice of accruals. In addition, the personnel cost accrual manipulation of the manager would be expected to increase effective corporate governance. Consequently, my analysis predicts a positive relationship between manager's compensation and corporate governance force. This expectation is in contrast to the argument suggested by rent extraction Bebchuk and Fried (2004). Their theory predicts a negative association between manager's compensation and the power of corporate governance mechanisms, as strong corporate governance , such as an independence of board, discourage executives to extract rents from shareholders.

There is extensive empirical literature that examines the relationship between board characteristics or audit committee, as the size, independence and expertise director on one side and company performance, the manager's remuneration, manager turnover and earnings management, on the other side (see KLEIN (2002), HERMALIN and WEISBACH (2003), FARBER (2005)).

This model is based the work of Drymiotes and Hemmer (2013) (hereafter called DH model), who detail a stylized two-period model describing how the accrual choice strategy, δ, affects the utility of reported accounting earnings, y_t, for both valuation and stewardship. In each period t, the manager contributes productive effort e_t to enhance the expected value of the firm's true economic income x_t, where δ denotes the manager's choice of accrual in the first period to report y_t, which will be fully reversed in the second period, according to the authors. Note that for the economic and accounting performance of the manager's output e_t to differ across two periods, in each period the manager can implement e^h or e^ℓ, which can produce one of two economic outcomes, x^H or x^L. But at the end of the first period, the manager observes the realization of true earnings and is required to issue an accounting report on the firm's periodic income and has some discretionary choice over the accounting earnings report, y^H or y^L. In particular, the DH model assumes that after the manager observes the true economic income in the first period (x^H or x^L), the likelihood of the aggressive (conservative) accrual choice increaseλ, that is, the probability increases of a high (low) report in the second period.

At this point a question arises for future research, according to Guttman (2013), under similar settings and conditions to the introduction of noise, as in the DH model (accruals that reverse), e.g., the corporate governance environment and/or

accounting reporting system improve the informativeness of the aggregate report about the fundamentals. I assume earnings management as a policy parameter has a cost, subject to public policies and corporate governance. This study also intends to show that changes of accounting system or corporate governance can influence the optimal compensation system of the manager in the game. My model aims to explore the implications of how payment practices change across firms with the efficiency of the internal control systems, in other words corporate governance.

3.2   BASIC MODEL SCHEME

Based on the DH Model, consider scenario where a risk-neutral principal employs a risk-averse agent (manager) to supply unobservable effort:

- Manager's effort choice $e_t \in \{e^h, e^\ell\}$, where $e^h > e^\ell$;

- True economic output: $x_t \in \{x^H, x^L\}$, where $x^H > x^L$;

- Subsequent financial report information about economic result x_t, denoted by $y_t \in \{y^H, y^L\}$, where $y^H > y^L$.

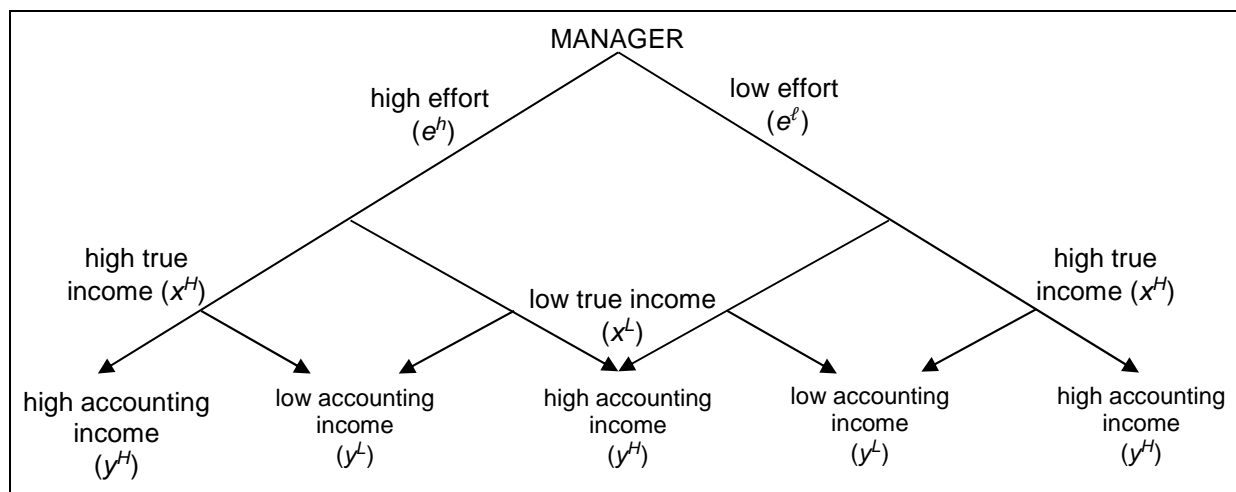The relationships between e_t and x_t and between x_t and y_t are summarized in Figure 1.

Figure 1. Timeline of disclosure and notation.
Source: Author.

The probability of outcome of the firm's financial system is defined as:

- λ^H: probability the firm's financial report system will capture high accounting earnings when the real economic earnings are high;

- λ^L : probability the firm's financial report system will capture low accounting earnings when the real economic earnings are low;

- Where: $\lambda^H \geq 1 - \lambda^H$ and $\lambda^L \geq 1 - \lambda^L$, consequently λ^H and $\lambda^L \in [\frac{1}{2}, 1]$.

The accrual choice δ in the 1st period, which if chosen is expected to reverse in the 2nd period. This parameter measures the manager's ability to redistribute accruals between periods, where $\delta \in [\underline{\delta}, \overline{\delta}]$, $\underline{\delta} < 0$ and $\overline{\delta} > 0$.

The corporate governance Γ capture the quality of internal control systems, where $\Gamma \in [0, 1]$. The parameter Γ can be interpreted as a measure of the effectiveness of the internal mechanisms of the firm. All else being equal, stronger corporate governance would make it more difficult the manager to engage in earnings management. My search thus provides a positive association between executive compensation and corporate governance force. Firms with weak corporate

governance encourage the practice of earnings manipulation; otherwise, strong corporate governance mitigates the practice of earnings manipulation. For example, the accruals manipulation will be relatively easy (i.e., Γ is relatively low), if not the internal mechanisms are negligent, or internal corporate governance is weak or the company operates in a complex business environment.

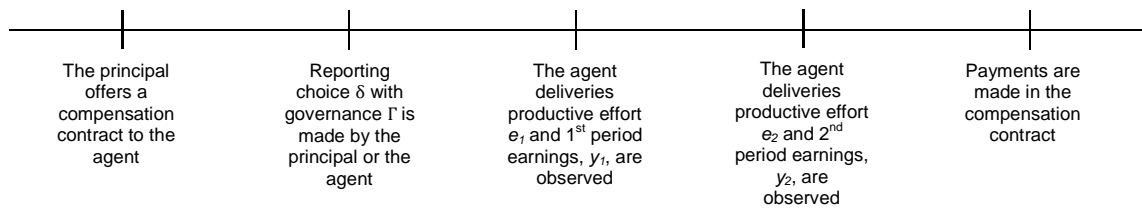The events of this model can be summarized by Figure 2:

Figure 2. The sequence' timeline of events on process.
Source: Adapted from Drymiotes and Hemmer, 2013.

At this point, for simplicity the accounting choice can only be made at the beginning of the 1st period to ensure that by the end of the 2nd period the accruals are fully reversed:

$$Prob\left(y_1^H \middle| x_1^H, \Gamma\delta\right) = \lambda^H + \Gamma.\delta \Rightarrow Prob\left(y_2^H \middle| x_2^H, \delta.\Gamma\right) = \lambda^H - \Gamma.\delta \tag{1}$$

$$Prob\left(y_1^L \middle| x_1^L, \Gamma\delta\right) = \lambda^L - \Gamma.\delta \Rightarrow Prob\left(y_2^L \middle| x_2^L, \delta.\Gamma\right) = \lambda^L + \Gamma.\delta \tag{2}$$

Was limited possible value for δ within the range $\delta \in \left[\max\{\lambda^L\text{-}1, \lambda^H\text{-}1\}, \min\left\{1 - \lambda^L, 1 - \lambda^H\right\}\right]$ to specify good and bad news. At this point, it is important to emphasize that an accruals choice "aggressive" or "conservative" in the first period means that the manager will report the earnings more "conservative" or "aggressive", respectively, in the second period. In a neutral accounting system, the expected accounting income in t+n periods would be the same as the real

economic income. Other words, $\delta = 0$ using an accounting metric as an example, we would have a market-to-book equals 1 for a neutral accounting system.

The odds both periods, first and second, can be analyzed in Figures 3 and 4. The probability set (in bold) of the accrual choice scheme in the first period can be summarized by Figure 3. The figure depicts probabilities based on DH model.
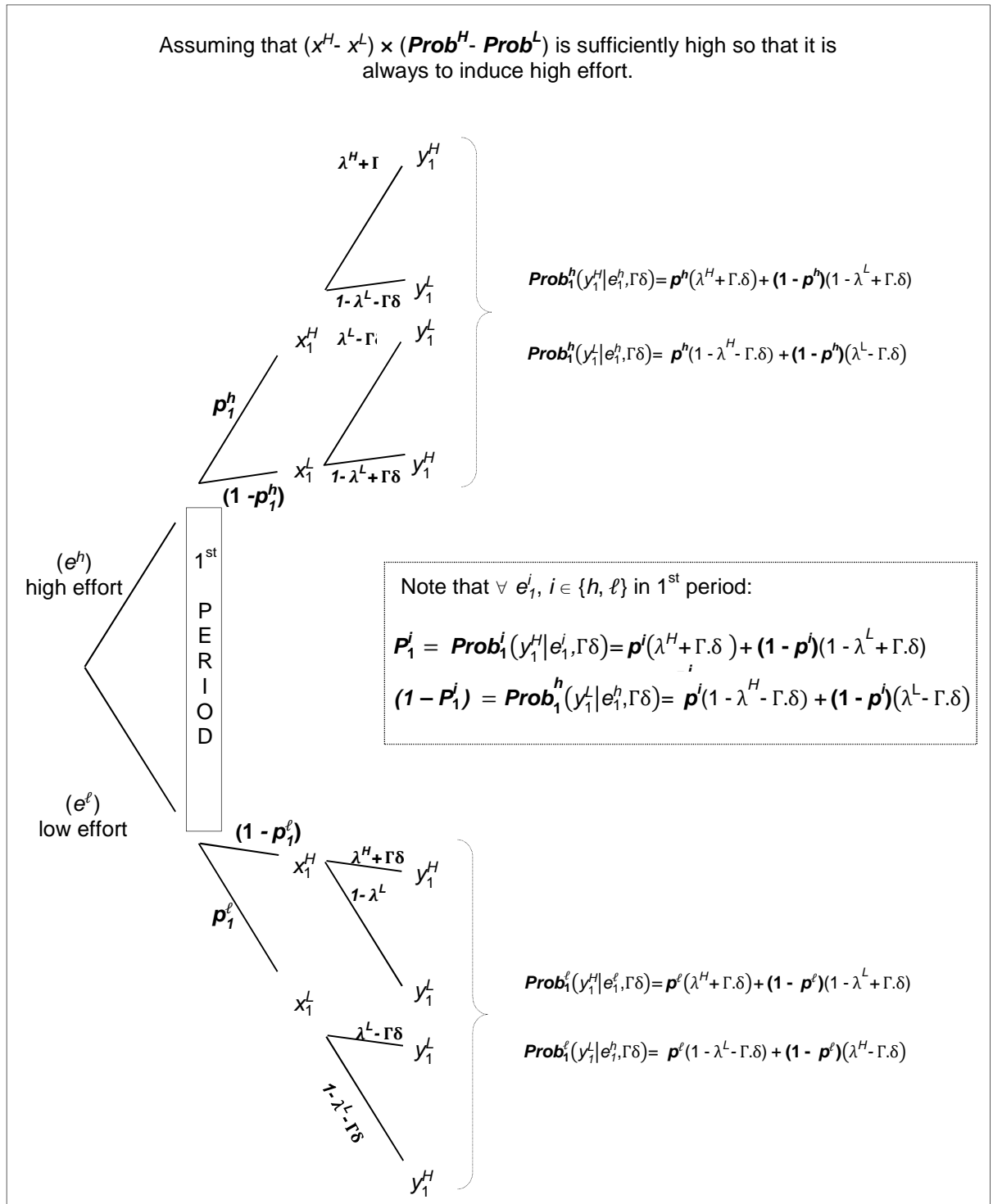
Assuming that $(x^H - x^L) \times (\textbf{Prob}^H - \textbf{Prob}^L)$ is sufficiently high so that it is always to induce high effort.

$\lambda^H + \Gamma$ y_1^H

$1 - \lambda^L - \Gamma\delta$ y_1^L

$\textbf{Prob}_1^h(y_1^H | e_1^h, \Gamma\delta) = \textbf{p}^h(\lambda^H + \Gamma.\delta) + \textbf{(1 - p}^h)(1 - \lambda^L + \Gamma.\delta)$

x_1^H $\lambda^L - \Gamma$ y_1^L

$\textbf{Prob}_1^h(y_1^L | e_1^h, \Gamma\delta) = \textbf{p}^h(1 - \lambda^H - \Gamma.\delta) + \textbf{(1 - p}^h)(\lambda^L - \Gamma.\delta)$

$\textbf{p}_1^h$

x_1^L $1 - \lambda^L + \Gamma\delta$ y_1^H

$\textbf{(1 - p}_1^h)$

(e^h) high effort

1st PERIOD

Note that $\forall\ e_1^i,\ i \in \{h, \ell\}$ in 1st period:

$$\textbf{P}_1^i = \textbf{Prob}_1^i(y_1^H | e_1^i, \Gamma\delta) = \textbf{p}^i(\lambda^H + \Gamma.\delta) + \textbf{(1 - p}^i)(1 - \lambda^L + \Gamma.\delta)$$

$$\textbf{(1 - P}_1^i) = \textbf{Prob}_1^h(y_1^L | e_1^h, \Gamma\delta) = \textbf{p}^i(1 - \lambda^H - \Gamma.\delta) + \textbf{(1 - p}^i)(\lambda^L - \Gamma.\delta)$$

(e^ℓ) low effort

$\textbf{(1 - p}_1^\ell)$

x_1^H $\lambda^H + \Gamma\delta$ y_1^H

$1 - \lambda^L$

$\textbf{p}_1^\ell$

y_1^L

x_1^L

$\textbf{Prob}_1^\ell(y_1^H | e_1^\ell, \Gamma\delta) = \textbf{p}^\ell(\lambda^H + \Gamma.\delta) + \textbf{(1 - p}^\ell)(1 - \lambda^L + \Gamma.\delta)$

$\lambda^L - \Gamma\delta$ y_1^L

$\textbf{Prob}_1^\ell(y_1^L | e_1^h, \Gamma\delta) = \textbf{p}^\ell(1 - \lambda^L - \Gamma.\delta) + \textbf{(1 - p}^\ell)(\lambda^H - \Gamma.\delta)$

$1 - \lambda^L - \Gamma\delta$

y_1^H

Figure 3. Probabilistic relationship between effort and economic and accounting outcomes.
Source: Author.

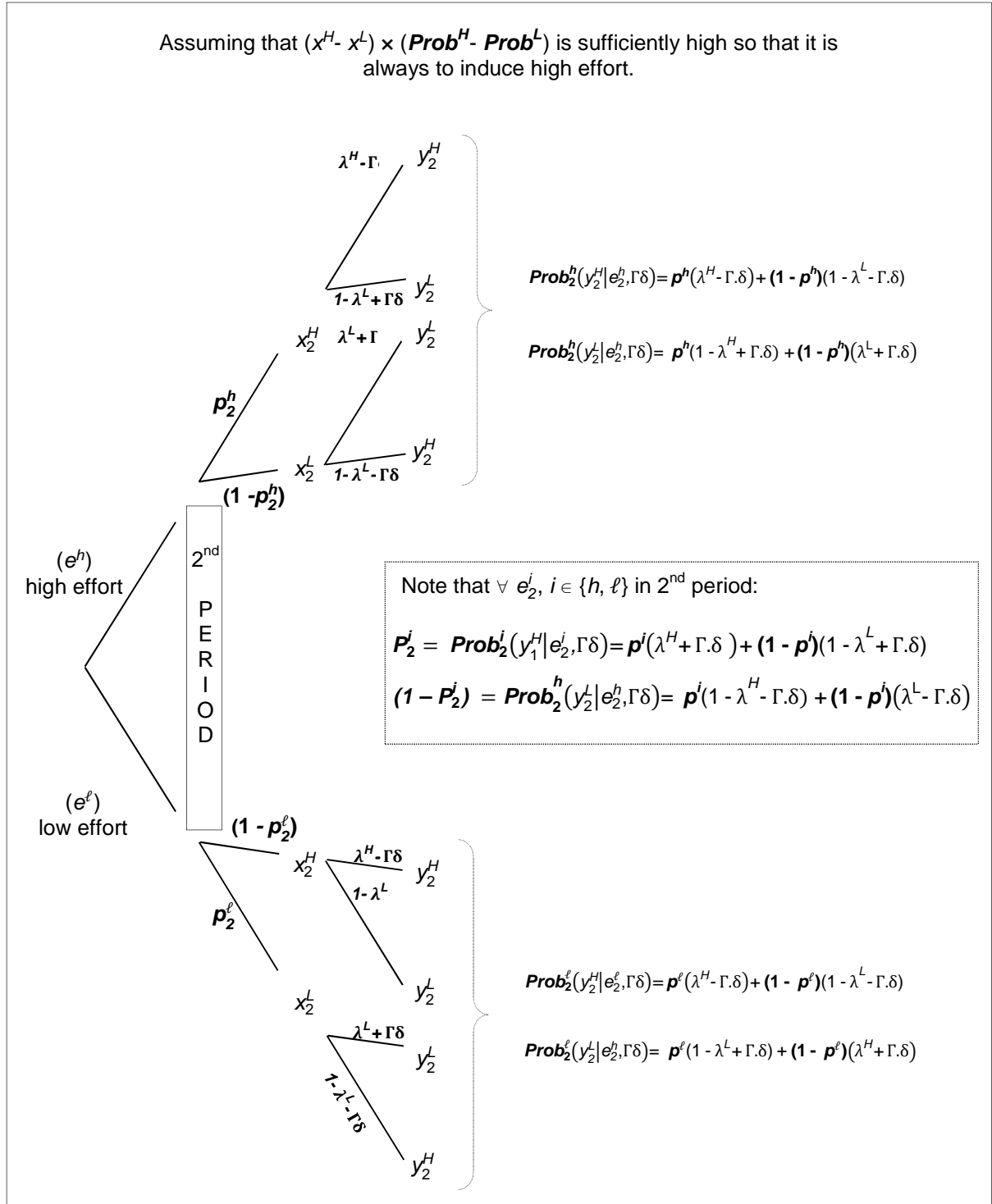Figure 4 summarizes the probability set (in bold) behind the accrual choices scheme in second period.

Figure 4. Probabilistic relationship between effort and economic and accounting outcomes.
Source: Author.

3.3 OPTIMAL CONTRACT

Letting $I(.)$ denote the financial benefit received by the manager's action (incentive), which is a function of signals both players have access to, also directly or as a result of communication, his utility function is given by:

$$A(I(.),e) = U\big(I(.)\big) - \sum_{t=1}^{n} V \tag{4}$$

$U'(.)>0$ and $U''(.)<0$ for risk aversion, and $V'(.) > 0$ for effort aversion (cost).

The relation between the manager's effort and firm output is captured by:

$$Prob\big(x_t^H \big| e_t\big) \text{ where, } 1 > Prob\big(x_t^H \big| e_t^h\big) > Prob\big(x_t^H \big| e_t^\ell\big) > 0, \text{ for } t = 1,2 \tag{5}$$

$$V\big(e_t^h\big) = V > V\big(e_t^\ell\big) = 0 \tag{6}$$

When the manager is not argued to make timely disclosures, the optimal choice use of the accounting reports for the purpose and incentive the manager to do high effort can be obtained as the solution to the following:

$$\min_{\Gamma\delta(y_1,y_2)} E\,[I|(y_1,y_2)|e_1^h,e_2^h,\Gamma\delta] \tag{7}$$

s.t.

$$E\,[I|(y_1,y_2)|e_1^h,e_2^h,\Gamma\delta] \geq \bar{U}\,. \tag{IR}$$

$$E\,[A|I(y_1,y_2)|e_1^h,e_2^h,\Gamma\delta] \geq E\,[A|I|(y_1,y_2)|e_1^\ell,e_2^h,\Gamma\delta] \tag{IC_1}$$

$$E\,[A|I(y_1,y_2)|e_2^h,\Gamma\delta,y_1^H] \geq E\,[A|I|(y_1,y_2)|e_1^\ell,\Gamma\delta,y_1^H] \tag{IC_2^{yH}}$$

$$E\,[A|I(y_1,y_2)|e_2^h,\Gamma\delta,y_1^L] \geq E\,[A|I|(y_1,y_2)|e_1^\ell,\Gamma\delta,y_1^L] \tag{IC_2^{yL}}$$

Where $E\,[A|\mathrm{I}(y_1,y_2)|e_1^h,e_2^h,\Gamma\delta]$ represents the manager's aggregate expected utility over the two time periods, conditional on the compensation contract $\mathrm{I}(y_1,y_2)$, the first-period and second-period productive effort, e_1 and e_2 respectively, accounting choice δ with corporate governance Γ.

In the first period the manager supplies productive effort e_1 and reports y_1 as a result. Then the manager supplies effort e_2 in the second period and reports y_2. Similarly, $E\,[\mathrm{I}|(y_1,y_2)|e_2^h,\Gamma\delta,y_1\,]$ represents the manager's second-period expected utility conditional on the compensation contract $\mathrm{I}(y_1,y_2)$, productive effort e_2, first period accounting choice δ with corporate governance Γ, and first period accounting earnings y_1.

Considering the previous principal' problem, individual rationality (IR) constraint, and incentive compatibility (IC) constraint, the optimal compensation contract is given by:

$$\bar{U}^{HH} = (2 - P_1^h - P_2^h)\,\Omega + \bar{U} + 2V \tag{8}$$

$$\bar{U}^{HL} = \bar{U}^{LH}\,(1 - P_1^h - P_2^h) + \bar{U} + 2V \tag{9}$$

$$\bar{U}^{LL} = (-P_1^h - P_2^h) + \bar{U} + 2V \tag{10}$$

where, $\Omega = \dfrac{V}{(p^h - p^l)(\lambda^H - \lambda^L)}.$

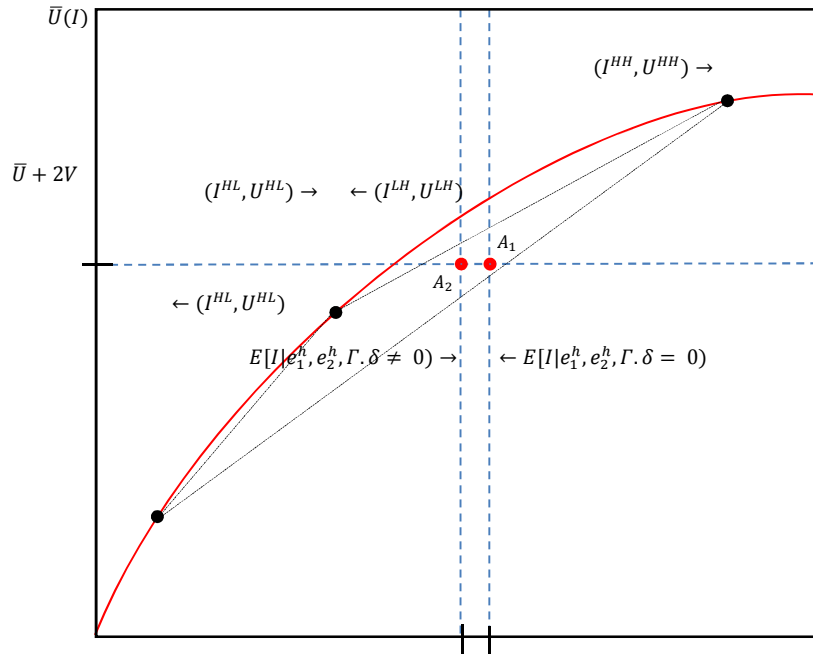Figure 5 explains the contract framework for dynamic component models:

Figure 5. The effect accounting choices (δ) with governance (Γ) on expected costs.
Source: Adapted from Drymiotes and Hemmer, 2013.

3.4 ACCOUNTING CHOICE AND CORPORATE GOVERNANCE

From the optimal compensation contract and considering the assumptions of the basic model, the distribution of aggregate ($y_1 + y_2$) earnings (where the manager can earn: $2y^H$, $y^H + y^L$ and $2y^L$) as a function of accrual choice δ:

$$\frac{\partial\left(Prob\left(y_1^H, y_2^H \big| e_1^h, e_2^h, \Gamma\delta\right)\right)}{\partial\delta} = \frac{\partial P_1^h P_2^h}{\partial\delta} = -2\delta \tag{11}$$

$$\frac{\partial\left(Prob\left(y_1^H, y_2^L \big| e_1^h, e_2^h, \Gamma\delta\right) + Prob\left(y_1^L, y_2^H \big| e_1^h, e_2^h, \Gamma\delta\right)\right)}{\partial\delta} = \frac{\partial(P_1^h(1 - P_2^h) + (1 - P_1^h) P_2^h)}{\partial\delta} = 4\delta \tag{12}$$

$$\frac{\partial\left(Prob\left(y_1^L, y_2^L \middle| e_1^h, e_2^h, \Gamma\delta\right)\right)}{\partial\delta} = \frac{\partial((1-P_1^h)+(1-P_2^h))}{\partial\delta} = -2\delta \qquad (13)$$

Thus, accrual choices strategy ($\delta<0$ conservative or $\delta>0$ aggressive) "squeeze" the aggregate earnings moving the probabilities for the "tails" (y_1^H, y_2^H) and (y_1^L, y_2^L), and the "middle" results (y_1^H, y_2^L) and (y_1^L, y_2^H).

At this point, is observed how corporate governance affects the distribution of earnings in relation differentiating to Γ:

$$\frac{\partial\left(Prob\left(y_1^H, y_2^H \middle| e_1^h, e_2^h, \Gamma\delta\right)\right)}{\partial\Gamma} = \frac{\partial P_1^h P_2^h}{\partial\Gamma} = -2\Gamma \qquad (14)$$

$$\frac{\partial\left(Prob\left(y_1^H, y_2^L \middle| e_1^h, e_2^h, \Gamma\delta\right) + Prob\left(y_1^L, y_2^H \middle| e_1^h, e_2^h, \Gamma\delta\right)\right)}{\partial\Gamma} = \frac{\partial(P_1^h(1-P_2^h)+(1-P_1^h)P_2^h)}{\partial\Gamma} = 4\Gamma \qquad (15)$$

$$\frac{\partial\left(Prob\left(y_1^L, y_2^L \middle| e_1^h, e_2^h, \Gamma\delta\right)\right)}{\partial\Gamma} = \frac{\partial((1-P_1^h)+(1-P_2^h))}{\partial\Gamma} = -2\Gamma \qquad (16)$$

Again, is observed the same configuration in relation to corporate governance "tightens" the aggregate earnings (y_1+y_2) moving the mass probability for the "tails" and "middle" outcomes.

Taking into account the curvature of the optimal compensation contract with two aggregate periods, payment has been as follows:

$$G(U\_{}^{HH}) + 2k + s, \qquad (17)$$

$$G(U\_{}^{LL}) + k, \qquad (18)$$

$$G\,(U\_{}^{LL}),\tag{19}$$

where G is the inverse of the agent's utility, k and s are positive (strictly) constants due the convexity[7] of function G.

Consider the probability in neutral accounting $\delta=0$ denoted by $\psi = $ *Prob* $(y_t^H|e^h,\delta=0) \equiv \lambda^H p^h + (1-\lambda^L)(1-p^h)$. The expected compensation of manager can be write as

$$
\begin{aligned}
E\,[I|\Gamma\delta] = {} & (\psi+\delta\Gamma)(\psi-\delta\Gamma)\times[\,G(U^{LL})+2k+s\,] \\
& + (\psi+\Gamma\delta)(1-\psi-\Gamma\delta)\times[G(U^{LL})+k] \\
& + (1-\psi-\Gamma\delta)(\psi-\delta)\times[G(U^{LL})+k] \\
& + (1-\psi-\Gamma\delta)(1-\psi+\Gamma\delta)\times[G(U^{LL})
\end{aligned}\tag{20}
$$

Accordingly, $E\,[I|\delta]$ is reduced by taking either most positive or most negative accrual presented in the 1st period.

$$\frac{\partial E\,[I|\Gamma\delta]}{\partial\delta} = -2\Gamma\delta \times s \tag{21}$$

Differentiating the result with respect to Γ I find:

$$\frac{\partial^2 E\,[I|\Gamma\delta]}{\partial\delta\,\partial\Gamma} = -2\delta \times s \quad >0,\quad \text{if } \underline{\delta} \tag{22}$$

and

$$\frac{\partial E\,[I|\Gamma\delta]}{\partial\delta} = -2\delta \times s \quad >0,\quad \text{if } \underline{\delta}$$

---

[7] Convexity and the proprieties of the derivate Df(x)(y-x)≤f(y)-f(x) for all x,y∈D permit the assumptions. (SUNDARAM, 1996).

Corollary 1: *For a conservative accounting policy $\delta<0$, a weak (strong) corporate governance policy Γ positively (negatively) impacts the effect of earnings management on the manager's income $E[A|I]$.*

To summarize, the worse corporate governance ($\uparrow \Gamma$, where $\Gamma \in [0, 1]$) in a conservative accounting setting, the greater will be the effect of the accruals choice on the manager's pay($\uparrow \frac{\partial^2 E[I|\Gamma\delta]}{\partial\delta\,\partial\Gamma}>0$). Weak governance encourages the manager to increase the level of earnings management, because there are no strong punishment mechanisms, so the opportunity cost between managing earnings and punishment declines in weak governance settings. A decline in the quality of governance makes it easier for the manager to reverse accruals, even with a conservative accounting policy.

On the other hand, in the presence of better corporate governance ($\downarrow \Gamma$), the choice of accruals will have a greater impact on the manager's payment ($\downarrow \frac{\partial E[I|\Gamma\delta]}{\partial\delta} = -2\Gamma\delta \times s>0$). With an increase in monitoring and likelihood of punishment, the manager will prefer to follow a conservative accounting policy, under which it is harder to reverse the accruals established now (*t*) in the next period (*t+1*).

Recall the result of Equation (17), on conservative accounting policy systems the change in corporate governance can be expressed by:

$$\frac{\partial^2 E[I|\Gamma\delta]}{\partial\delta\,\partial\Gamma} = -2\delta \times s \quad <0, \quad \text{if } \overline{\delta} \tag{23}$$

and

$$\frac{\partial E[I|\Gamma\delta]}{\partial\delta} = -2\delta \times s \quad <0, \quad \text{if } \overline{\delta}$$

Corollary 2: *For an aggressive accounting policy $\delta > 0$, a weak (strong) corporate governance policy negatively (positively) impacts the effect of earnings management on the manager's income $E[A|I]$.*

In turn, when earnings management happens in an aggressive accounting environment ($\uparrow \bar{\delta}$), the effect of worse governance will be even more negative on the manager's income ($\downarrow E[A|I]$), which will decline with each monetary unit of earnings managed. The intuition for this result is that there is a tradeoff for managers, if the aggressive policy endures and the governance weakens, there can be greater punishment by the market (lower market value), so the manager will earn even less. In contrast, if governance ($\downarrow \Gamma$) gets stronger, there can be a better market valuation and stronger effect can occur on his income in detriment to a gain from managing earnings ($\downarrow \frac{\partial E[I|\Gamma\delta]}{\partial \delta_{(-)}} = -2\Gamma\delta \times s < 0$).

3.5   CONCLUSION

In this article I sought to verify the impact of governance in a temporal system with two periods ($t = 1, 2$) on the choice of accounting accruals. In particular, my interest was to check how much governance can impact the pay of a manager who makes choices on accruals. In this process, the modeling of the variables demonstrated two important insights: first, the importance of accounting policy (aggressive or conservative) on the choice of accruals and how this policy can affect the output of the contract between the owner and manager, and second, how the quality of governance can impact the choice of accruals, and consequently the

manager's pay. By testing the impact of governance in the DH model, I found that besides the accounting policy setting, corporate governance can also affect the manager's behavior in choosing accruals. For example, in a setting with aggressive accounting, the effect of worse governance will have an even more negative effect on the manager's income, while with better governance, there can be a better market valuation of the firm, raising the manager's income and a greater effect on the manager's income.

A better understanding of the dynamics between accounting variables and the theory of contracts can improve the model designed, such as by introducing monitoring variables like auditing, which can be a proxy for punishment of the manager. With respect to governance, the model took into consideration its effect as an exogenous shock, which can be a limitation of the model in case of an empirical application.

4 INTERACTION OF MEDIA COVERAGE AND FIRMS' FUNDAMENTALS: EVIDENCE FROM BRAZIL

4.1 INTRODUCTION

Accounting numbers such as abnormal earnings are an important source of information about firms' value. The seminal paper of Ball and Brown (1968) and Beaver (1968) addressed the information content of accounting numbers. However, other sources can also contain relevant information about value and future earnings. Ohlson (1995) applied a linear model to analyze the effect of other information (i.e., firm fundamentals such as market share and size, industry data and macroeconomic data etc.) on the abnormal earnings series.

Ohlson (1995) proposed that firm value can be projected by abnormal earnings and other information. The basic hypothesis of the this model is that other information has effects on abnormal earnings. But there is a lack of studies about other information when using Ohlson's model (HAND, 2001).

Information such as news from financial journals is one of these sources. For example, according Chen et al. (2011), before official earnings announcement, information related to a firm's results is sometimes disclosed by news reports and investors might incorporate this unofficial information into their choices. The return-earnings ratio can be better modeled if relevant information from financial news sources can be captured.

There is evidence that media coverage affects stock prices (La Porta et al., 1979). Dyck and Zingalles (2008) observe that stock prices have (strong) reactions to

published news stories. This effect is stronger for firms with fewer analysts and when the media outlet in question is more credible.

Gurun and Butler (2012) find that abnormal positive local media slant strongly transmits to firm equity value and the effects are stronger for small firms, firms held mostly by individual investors, illiquid firms or firms with highly volatile stock prices, and firms with low analyst coverage or highly dispersed analyst forecasts. Tetlock (2007) and Tetlock et al. (2008) show that reports in financial newspapers are associated with substantial price responses. The authors suggest that high media coverage pessimism exerts downward pressure on stock prices followed by a lapse for operation of firm fundamentals, and abnormally high or low pessimism tends to cause high market trading volume.

4.2   BACKGROUND AND PROPOSAL

In Brazil, Lopes and Walker (2008), and Alencar and Lopes (2010) suggest that the stock market is characterized by low enforcement, with incentives to earnings management and poor governance standards that induce large variability of disclosure.

Beyer et al. (2010) suggest that one of the important roles of accounting is to help capital providers such as shareholders evaluate investment opportunities and allocate their capital to the proper place. In theory, Diamond and Verrecchia (1991) and Kim and Verrecchia (1994) argue that voluntary disclosure of accounting information reduces information asymmetry between uninformed and informed investors. Consistent with such predictions, considerable research has provided evidence that firms with high disclosure quality experience favorable stock market

consequences such as better liquidity, lower cost of capital and more thorough monitoring by analysts, mitigating information asymmetries. For example, Farragher et al. (1994) and Lang and Lundholm (1993) find that disclosure scores are negatively associated with analysts' forecasting errors and the standard deviation of stock returns.

On the other hand, recent finance and accounting studies suggest that high visibility actually brings similar capital market effects as accounting disclosure does. Theoretically, Merton (1987) suggests that the cost of capital should go down as more investors recognize a firm's existence. Empirically, Coval and Moskowitz (1999) find that U.S investment managers tend to invest in local firms, indicating the existence of a home bias. Huberman (2001) finds that familiar stocks attract more investors. Grullon et al. (2004) also find that more visible firms (measured by higher advertising expenditures) tend to have a larger number of shareholders and better liquidity. In addition, Frieder and Subrahmanyam (2005) find that individual investors tend to purchase stocks with high recognition due to their sale of easily recognized products. Also, Lehavy and Sloan (2008) suggest that firm visibility impacts stock price even more than fundamentals. These studies indicate that visibility or familiarity influences investors' decisions to purchase stocks or propensities to hold stocks, thus affecting stock liquidity and cost of capital.

Considering that visibility and accounting information bring similar capital market outcomes, the question to ask is whether accounting disclosure makes a marginal contribution to firms' valuation after controlling for visibility from media coverage. In this paper, I address the following question: ***Do firms' fundamentals have different effects on their valuation when considered together with media coverage?***

4.3 HYPOTHESIS

Based on this theoretical background, and on the predictions and claims presented, I formally state my hypothesis:

H₁(i): The abnormal earnings of firms in the upper media coverage quartile will have less impact by means of firm fundamentals.

H₁(ii): The abnormal earnings of firms in the lower media coverage quartile will have more impact by means of firm fundamentals.

Theoretically, qualitative information about a firm should be incorporated into its stock price. Risk and uncertainty predict low earnings and stock returns according to Li (2006).

The information dynamic in Ohlson's model is expressed by adding another variable, v_t, to include information other than abnormal earnings.

In Ohlson's linear model (Ohlson, 1995), abnormal earnings compose a linear time series, where xa_{t+1} abnormal earnings at *t+1* depend on xa_t, abnormal earnings at *t* with the other information v_t at date *t* as well, $xa_{t+1} = \omega xa_t + v_t + \varepsilon_{1t+1}$ and $v_{t+1} = \varphi v_{t+1} + \varepsilon_{2t+1}$, where v_t is information about future abnormal earnings not in current residual income; ω and φ are fixed persistence parameters, less than one and non-negative; and ε_{1t+1} and ε_{2t+1} are the disturbances with mean zero and constant variance.

I argue that media coverage and firms' fundamentals have different effects on abnormal earnings series. I use news from media as a proxy for investors' sentiment, and measure it as the number of news stories published about the firm in the Wall

Street Journal (WSJ) and the Brazilian counterpart Valor Econômico (VE) about Brazilian firms between 2008 and 2013.

I examine both the effect of media coverage at *t-1* on the change in abnormal earnings over the same period, considering the media coverage of Brazilian firms by the Wall Street Journal (WSJ) and Valor Econômico (VE), and then I quantify and measure the interactions between news stories (positive and negative) and abnormal return. For each day in the sample, I collected news stories from the two journals and counted the positive and negative words.

4.4   METHODOLOGY AND DATA

I used sentiment analysis (opinion mining) as a computational method to capture the opinion of the texts in WSJ and VE, in stories published from 2008 to 2013 (calculated quarterly) for all companies listed on the BM&FBovespa. Quarterly accounting variables from 2008 to 2013 were obtained from the Economática dataset. I collected 10,123 WSJ news articles from January 2008 to December 2013 and 35,290 news articles from VE in the same period. To conduct sentiment analyses from the news coverage, I created an automatic system, using XML Language in data mining program RapidMiner 5.3, an open-source data mining tool that permits access data and exports them from/to diverse big databases (html, xml, csv, .xml, etc.). There are possibilities of data transformation, evaluation, visualization, and modeling even for web mining and/ or text processing (Appendix B).

I conducted firm-based news coverage analysis by creating a system that automatically extracts and standardizes firm names from news headlines. I defined

that a firm has media coverage in WJS and VE if its name appeared at least once in the article, according to Figure 6.
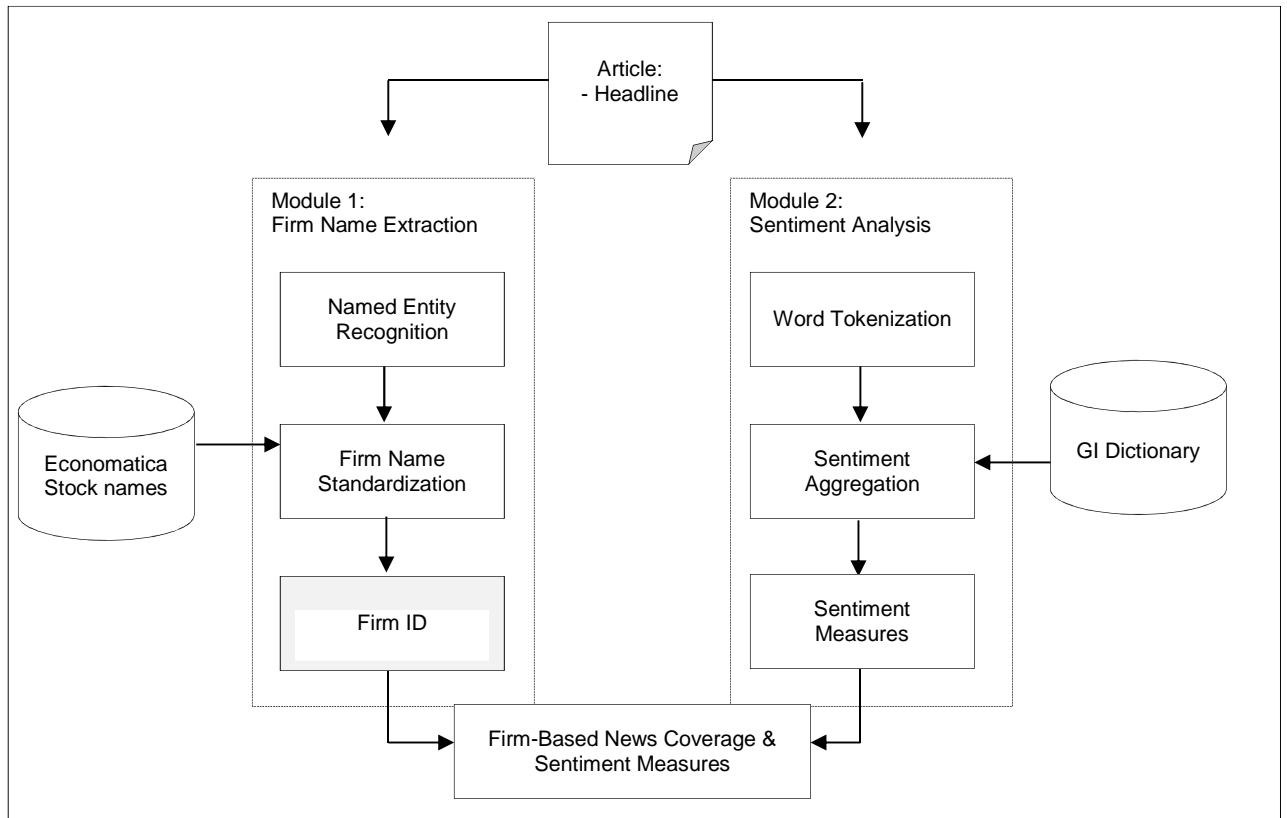

Figure 6. Media coverage (sentiment analysis) by firm.
Source: Author

I first input the news stories from the systems through the crawling we data mining tool, and then divided the sentences into words (tokenization) and removed the stop words, forming a data sample. Then the code calculated the number of words fitting in the positive or negative categories, according to the General Inquirer's Harvard psychosocial dictionary (two large valence categories)[8], replicating the procedure developed by Tetlock et al. (2008).

By combining the results of these the word modules (positive and negative), I counted the positive and negative words and total number of word in the articles on

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[8] Available at http://www.wjh.harvard.edu/~inquirer/homecat.htm.

each firm in each quarter. In case the firm had no news in WSJ and VE during the defined period, positive and negative word counts were considered missing.

The model defined by Tetlock (2007) was adopted to classify the news, as follows:

$$Sentiment = \frac{\sum_{id\ firm=j}^{n} Positive\ words - \sum_{id\ firm=j}^{n} Negative\ words}{\sum_{id\ firm=j}^{n} Positive\ words + \sum_{id\ firm=j}^{n} Negative\ words\ +1}\ ,\ n,j=1,\ 2,\ \ldots$$

I want to see if media coverage changes the effects of fundamentals on the firms' valuation. To accomplish this, I estimated the following statistical models:

- Given xa_t, I tested the parameter persistence ω (between zero and one) and calculated $xa_{t+1} = \omega xa_t + v_t + \varepsilon_{t+1}$;

- Then I estimated a model controlled by firm size (*Assets*) and revenue (*Sales*) to examine the relevance of other information[9], $xa_{t+1} = \alpha + \omega xa_t + v_t + \delta Sales + \theta Asset + \varepsilon_{t+1}$.

The control variable *GDP* growth was included to remove its potential influence on the persistence parameter, calculated as follows:

$$xa_{t+1} = \alpha + \omega xa_t + v_t + \gamma GDP + \delta Sales + \theta Asset + \varepsilon_{1t+1} \tag{1}$$

The media coverage *(MC)* sentiment was included to evaluate if it had informational content, that is, if the media coverage parameter *(β)* was positive and statistically significant. I examined the effect of media coverage at *t+1* on the change in abnormal earnings over the same period:

$$xa_{t+1} = \alpha + \omega xa_t + \beta MC_t + \varepsilon_{t+1} \tag{2}$$

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[9] I included as control variables the number of analysts and the number or recommendations by analysts for each firm (data collected from I/B/E/S), as sources of other information. When joining the resulting data with the other data already collected, the sample size declined by nearly 50%. Thus, I decided not to include such variables in the study.

Thus, I included firm all control variable (GPD, Sales and Assets). The regression equation is as follows:

$$xa_{t+1} = \alpha + \omega xa_t + v_t + \beta MC_t + \gamma GDP + \delta Sales + \theta Asset + \varepsilon_{1t+1} \qquad (3)$$

Table 8 reports the descriptive statistics separately for groups and the overall sample. In the overall sample, the average *Media Coverage Sentiment* score (from WSJ plus VE) is -0.0257. Prominently, firms in the lower quartile have negative *Media Coverage Sentiment* score too. On the other hand, firms in the upper quartile have a positive score (0.0698). Calculating the abnormal return requires both stock return data and the trading volume for the period. Consequently, after removing all reports for the periods mentioned during which there was no trading data available in the Económica. The average of abnormal earnings on date *t* of the lower quartile is quite small (-2.3795), with a relatively large dispersion (std. dev.= 2.4639), while the dispersion of the upper quartile is smaller (std. dev.= 0.4777). The size (Assets) and revenue (Sales) were log-transformed to correct their asymmetric distribution.

TABLE 8. DESCRIPTIVE STATISTICS OF FIRM-SPECIFIC VARIABLES

Firm-specific variables		Overall Sample	Group1 (Lower Quartile)	Group 2 (Upper Quartile)
AbEarnings$_t$	Mean	-2.3732	-2.5193	-2.2959
	Median	-2.3720	-2.3795	-2.3600
	Std.Dev.	1.2944	2.4639	0.4777
AbEarnings$_{t+1}$	Mean	-2.3485	-2.3974	-2.3200
	Median	-2.3929	-2.3890	-2.3848
	Std.Dev.	0.5044	0.6396	0.4476
Media Coverage Sentiment$_t$	Mean	-0.0294	-0.0114	0.0803
	Median	-0.0257	-0.0278	0.0698
	Std.Dev.	0.4802	0.46775	0.4662
GDP$_t$	Mean	3.1284	3.1324	3.0716
	Median	2.4000	2.4000	2.2000
	Std.Dev.	3.2198	3.3517	3.0980
Log(Sales)$_t$	Mean	15.1111	14.6049	16.8273
	Median	15.1269	13.5364	17.1344
	Std.Dev.	1.9372	1.2508	1.9524
Log(Assets)$_t$	Mean	16.3719	15.7513	18.8664
	Median	16.3549	14.0584	18.8177
	Std.Dev.	1.9480	0.9025	1.2680

Source: Author.

In Table 9 I summarize the final sample as "Headline" of news stories in Valor Econômico, to which I applied the sentiment analysis method. I collected all the news stories which mentioned the name or stock ticker of the firms (*corpus* or headline), and then filter the sample to only contain news stories where the firm name appeared in the headline.

TABLE 9. SAMPLE OF THE NEWS STORIES IN JORNAL VALOR ECONÔMICO (2008-2013)

`	Sample Size	Obs. Deleted	Total Obs.
Sample of news stories from 2008 to 2013	35,290	4,201	31,089
Number of relevant observations (Headline) from 2008 to 2013	25,029	0	25,029
Total number of listed firms	169	110	59

Source: Author.

Table 10 reports the estimation results of the baseline model (Equation 1) for the VE sample. The results of Equation 2 show that the coefficient of the interaction between *Media Coverage Sentiment$_t$* and abnormal earnings at *t+1* (*AbEarnings$_{t+1}$*) is significantly positive only in the lower quartile (correlation coefficient = 0.0547; p-value < 0.05).

TABLE 10. MEDIA COVERAGE SENTIMENT – VALOR ECONÔMICO (2008-2013)

Panels A, B and C report the results of the basic equation of the Ohlson model (Column 1), analysis of sentiment about abnormal returns (Column 2) and the interaction between the sentiment analysis and control variables (Column 3). The last column reports the p-values of the difference in means, and heteroscedasticity-robust standard errors are clustered by firm. ∗∗∗, ∗∗, and ∗ represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	(Equation 1) $AbEarnings_{t+1}$	(Equation 2) $AbEarnings_{t+1}$	(Equation 3) $AbEarnings_{t+1}$
Panel A: Upper Quartile			
Media Coverage Sentiment$_t$		0.03855 (0.313)	0.0303 (0.374)
ωAbEarnings$_t$	0.0056 (0.000)***	0.1234 (0.000)***	0.1192 (0.000)***
GDP$_t$	0.0062 (0.000)***		0.0509 (0.000)***
Log(Sales)$_t$	0.0400 (0.127)		0.0582 (0.149)
Log(Assets)$_t$	0.1059 (0.013)**		0.2699 (0.011)
Adj. R-square	0.6727	0.5835	0.6736
Panel B: Lower Quartile			
Media Coverage Sentiment$_t$		0.0547 (0.050)**	0.0430 (0.084)
ωAbEarnings$_t$	0.4590 (0.000)***	0.7691 (0.000)***	0.7688 (0.000)***
GDP$_t$	0.0401 (0.000)***		0.0411 (0.000)***
Log(Sales)$_t$	0.0119 (0.345)		0.0057 (0.702)
Log(Assets)$_t$	-0.0425 (0.041)**		-0.0162 (0.736)
Adj. R-square	0.6705	0.6172	0.6994
Panel C: Overall Sample			
Media Coverage Sentiment$_t$		0.0170 (0.378)	0.0071 (0.686)
ωAbEarnings$_t$	0.1447 (0.000)***	0.1502 (0.000)***	0.1446 (0.000)***
GDP$_t$	0.0474 (0.000)***		0.0474 (0.000)***
Log(Sales)$_t$	0.0165 (0.249)		0.0165 (0.249)
Log(Assets)$_t$	0.3036 (0.000)***		0.3030 (0.000)***
Adj. R-square	0.4688	0.3547	0.4689
N. of Obs.	25,029		

Source: Author.

Table 11 shows the final sample as "Headline" of news in Wall Street Journal in which I applied the sentiment analysis method. First, I collected all the news stories mentioning the name or stock ticker of the firms (corpus‑text or headline), and then I filtered the sample leaving only news stories with headlines carrying the firm names.

TABLE 11. SAMPLE OF NEWS STORIES IN WSJ (2008-2013)

	Sample Size	Obs. Deleted	Total Obs.
Sample of the news stories from 2008 to 2013 (full text)	10,123	1,292	8,831
Number of relevant observations (Headline) from 2008 to 2013	6,201	0	6,201
Total number of listed firms	169	110	59

Source: Author.

I estimated Equations 1, 2 and 3 via OLS (ordinary least square regression). The final sample consisted of 1,296 firm-quarter observations. Table 12 reports the estimation results of the baseline model (Equation 1) for the WJS sample. The results show that the contemporaneous abnormal earnings score in the upper (lower) quartile of the sample is 0.0056 (0.4590) and is significantly positive. Likewise, the results are consistent for the overall sample (0.1447). As indicated in the last two columns, my main concern is the interaction between *Media Coverage Sentiment$_t$* and abnormal earnings at *t+1* (*AbEarnings$_{t+1}$*). The estimated coefficient of *Media Coverage Sentiment$_t$* is significantly positive in both quartile samples and the overall sample. A much smaller coefficient (0.0317) in the lower quartile indicates smaller market reactions given the same abnormal earnings and other firm characteristics. My empirical result supports **H$_1$(i)**, which predicts that firms' returns in the lower media coverage quartile have more impact than firms' fundamentals. It is interesting to note that the estimated coefficient for media coverage sentiment (*Media Coverage Sentiment$_t$*) is still significant in Equation 2 (correlation coefficient = 0.0554; p-value <

0.05) and Equation 3 (correlation coefficient = 0.0583; p-value < 0.05) in the overall sample. Moreover, **H$_1$(ii),** which forecasts that firms return in the lower media coverage quartile will have more impact than firms' fundamental was supported by the estimated coefficients for media coverage sentiment in Equation 2 (correlation coefficient = 0.0571; p-value < 0.05) in the upper quartile, but not significant in Equation 3.

TABLE 12. MEDIA COVERAGE SENTIMENT IN WSJ (2008-2013)

Panels A, B and C report the results of the basic equation of the Ohlson model (Column 1), analysis of sentiment about abnormal returns (Column 2) and the interaction between the sentiment analysis and control variables (Column 3). The last column reports the p-values of the difference in means, and heteroscedasticity-robust standard errors are clustered by firm. ∗∗∗, ∗∗, and ∗ represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	(Equation 1) $AbEarnings_{t+1}$	(Equation 2) $AbEarnings_{t+1}$	(Equation 3) $AbEarnings_{t+1}$
Panel A: Upper Quartile			
Media Coverage Sentiment$_t$		0.0830 (0.049)**	0.1179 (0.002)**
ωAbEarnings$_t$	0.0056 (0.000)***	0.1252 (0.000)***	0.1216 (0.000)***
GDP$_t$	0.0062 (0.000)***		0.0532 (0.000)***
Log(Sales)$_t$	0.0400 (0.127)		0.0648 (0.101)
Log(Assets)$_t$	0.1059 (0.013)**		0.2548 (0.015)**
Adj. R-square	0.6727	0.5876	0.6838
Panel B: Lower Quartile			
Media Coverage Sentiment$_t$		0.0571 (0.059)**	0.0317 (0.244)
ωAbEarnings$_t$	0.4590 (0.000)***	0.7671 (0.000)***	0.7664 (0.000)***
GDP$_t$	0.0401 (0.000)***		0.0410 (0.000)***
Log(Sales)$_t$	0.0119 (0.345)		0.0060 (0.687)
Log(Assets)$_t$	-0.0425 (0.041)**		-0.0093 (0.846)
Adj. R-square	0.6705	0.6169	0.6705
Panel C: Overall Sample			
Media Coverage Sentiment$_t$		0.0554 (0.015)**	0.0583 (0.005)**
ωAbEarnings$_t$	0.1447 (0.000)***	0.1514 (0.000)***	0.1458 (0.000)***
GDP$_t$	0.0474 (0.000)***		0.0475 (0.000)***

	(Equation 1) $AbEarnings_{t+1}$	(Equation 2) $AbEarnings_{t+1}$	(Equation 3) $AbEarnings_{t+1}$
Log(Sales)$_t$	0.0165 (0.249)		0.0475 (0.226)
Log(Assets)$_t$	0.3036 (0.000)***		0.3021 (0.000)***
Adj. R-square	0.4688	0.3575	0.4724
N. of Obs.	6,201		

Source: Author.

Table 13 summarizes the estimation results of the models in the merged sample (Wall Street Journal and Valor Econômico news stories together). The results of Equation 2 indicate that the estimated coefficient of the interaction between *Media Coverage Sentiment$_t$* and abnormal earnings at *t+1* (*AbEarnings$_{t+1}$*) is significantly positive in the upper quartile (correlation coefficient = 0.1170; p-value < 0.05); in the lower quartile (correlation coefficient = 0.1038; p-value < 0.05); and in the overall sample (correlation coefficient = 0.0629; p-value < 0.05). Furthermore, *Media Coverage Sentiment$_t$* is significant at 90% confidence level in the lower quartile of Equation 3. The estimated coefficients in the lower quartile sample (0.0707) and overall sample (0.0543) are significantly positive, respectively.

TABLE 13. MEDIA COVERAGE SENTIMENT – COMBINED WSJ & VE SAMPLE (2008-2013)

Panels A, B and C report the results of the basic equation of the Ohlson model (Column 1), analysis of sentiment about abnormal returns (Column 2) and the interaction between the sentiment analysis and control variables (Column 3). The last column reports the p-values of the difference in means, and heteroscedasticity-robust standard errors are clustered by firm. ∗∗∗, ∗∗, and ∗ represent statistical significance at the 1%, 5%, and 10% levels, respectively.

	(Equation 1) $AbEarnings_{t+1}$	(Equation 2) $AbEarnings_{t+1}$	(Equation 3) $AbEarnings_{t+1}$
Panel A: Upper Quartile			
Media Coverage Sentiment$_t$		0.1170 (0.038**)	0.1384 (0.006)*
ωAbEarnings$_t$	0.4590 (0.000)***	0.1240 (0.000)***	0.1197 (0.000)***
GDP$_t$	0.0401 (0.000)***		0.0521 (0.000)***
Log(Sales)$_t$	0.0119 (0.345)		0.0562 (0.156)
Log(Assets)$_t$	-0.0425 (0.041)**		0.2680 (0.011)*
Adj. R-square	0.6705	0.5882	0.6813

continued

	(Equation 1) AbEarningst+1	(Equation 2) AbEarningst+1	(Equation 3) AbEarningst+1
Panel B: Lower Quartile			
Media Coverage Sentiment$_t$			0.0707
			(0.046)**
ωAbEarnings$_t$	0.4590	0.1038	0.7695
	(0.000)***	*(0.008)**	*(0.000)****
GDP$_t$	0.0401	0.7710	0.0405
	(0.000)***	*(0.000)****	*(0.000)****
Log(Sales)$_t$	0.0119		0.0066
	(0.345)		*(0.654)*
Log(Assets)$_t$	-0.0425		-0.0129
	(0.041)**		*(0.787)*
Adj. R-square	0.6705	0.6212	0.7004
Panel C: Overall Sample			
Media Coverage Sentiment$_t$		0.0629	0.0543
		(0.028)**	*(0.037)***
ωAbEarnings$_t$	0.1447	0.1506	0.1449
	(0.000)***	*(0.000)****	*(0.000)****
GDP$_t$	0.0474		0.0473
	(0.000)***		*(0.000)****
Log(Sales)$_t$	0.0165		0.0168
	(0.249)		*(0.239)*
Log(Assets)$_t$	0.3036		0.3008
	(0.000)***		*(0.000)****
Adj. R-square	0.4688	0.3568	0.4708
N. of Obs.	25,029		

Source: Author.

Given the empirical support for the interaction between media coverage sentiment and abnormal earnings, it this important to know whether the significant result is driven by size (*Log(Assets)$_t$*) and sales (*Log(Sales)$_t$*). As indicated by the overall sample results, the estimated coefficient of *Log(Assets)$_t$* is still positive when *Media Coverage Sentiment$_t$* is included in the empirical model of Equation 3 for the upper quartile and overall sample.

4.5 CONCLUSION

This study investigates if firms' fundamentals have different behavior with the interaction of media coverage sentiment on their valuation. I collected news stories about Brazilian's firm listed on the BM&FBovespa in Wall Street Journal (WSJ) and Valor Econômico (VE) in the period between 2008 and 2013.

My empirical results have relevant inferences for managers and investors. The effect of additional news coverage on abnormal earnings is smaller if the abnormal earnings belongs lower firms. Firm's abnormal returns belong to firms ranked in the lowest quartile regarding media coverage. The abnormal returns of firms in the lowest media coverage quartile have more impact than firms' fundamentals. In other words, having more news coverage before positive earnings announcement actually disturbs abnormal earnings at *t+1*. If investors want to profit from the price movements around abnormal earnings announcements, they should avoid firms with high levels of news coverage, because these firms feel a stronger impact of media coverage sentiment. On other hand, abnormal returns of firms with less media coverage have more impact than firms' fundamentals.

The main limitation of this study is the absence of other variables to test the robustness of the model, such as information metrics like the Fog-Index for news. However, my study highlights the importance of financial news in conveying value-related information the market.

5 GENERAL CONCLUSION

In summary, this research examines interaction between the quality of earnings and disclosure of information and how these affect the decisions of investors and managers about the firm (e.g., management of accruals, pricing of shares with visibility). In the first paper, I looking for empirical evidence that the public familiarity of firms, by means of brand recognition, can attract certain types of investors, even in the presence of lower disclosure quality. I used as a visibility proxy the Landor index for American companies between 2007 and 2011, applied to data

obtained from the WRDS database, the firms' sites and the EDGAR/SEC base. The results suggest that firms with higher brand recognition but lower disclosure quality still attract a larger number of retail investors, have better liquidity and less volatile returns.

In the second paper I modeling how the corporate governance a affect the quality of earnings and accruals choice, in equilibrium. Decomposing earnings into two time periods, $t = 1, 2$, the manager chooses effort according to his ability to bias/reverse the earnings reported, even though the consequence on the probability distribution in the first period alters the distribution in the second one. In the second period, the manager's choice of more (less) effort affects the second component of earnings. The results suggests two important insights: the importance of accounting policy (aggressive or conservative) on the choice of accruals and how this policy can affect the output of the contract between the owner and manager; how the quality of governance can impact the choice of accruals, and consequently the manager's pay.

In conclusion, in the third topic I investigate whether firm fundamentals have different behavior when interacted with media sentiment in predicting abnormal returns. For this purpose, I collected news stories on Brazilian firms listed on the BM&FBovespa in Wall Street Journal and its Brazilian counterpart Valor Econômico, in the period from 2008 to 2013. The results indicate that abnormal returns of firms with media coverage sentiment in the upper quartile have less impact by means of firm fundamentals, while abnormal returns of firms in the lower media sentiment quartile have higher impact by means of fundamentals.

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APPENDIX

APENDIX A: Definition of Variables

Variable name	Description	Source	Name from Source
AT	= total assets	Compustat	AT
SPR	= share price	Compustat	PRCC_F
ROA	= return on assets (operating income before depreciation over total assets)	Compustat	OIBPP / AT
LEV	= leverage, the ratio of total debt to assets	Compustat	DLTT+DLC/AT
SALE	= sales over common shares, used to calculate EPS (earnings per share)	Compustat	SALE / CSHPRI
CAPEX	= capital expenditures over common shares, used to calculate EPS	Compustat	CAPXV / CSHPRI
TQ =	= Tobin's Q (market value + preferred stock + total debt] / total assets	Compustat	[(PRRC_F*CSHO) +PSTK+DLTT +DLC] / AT
MVE	= market value of equity (fiscal year closing price multiplied by number of share outstanding)	Compustat	PRCC_F * CSHO
AGE	= firm age (years) is constructed as the number of years the firm has existed in the CRSP / Compustat database for since IPO/founding (Ritter and Loughran, 2004)[a]	Compustat and CRSP	merged Compustat / CRSP / Ritter and Loughran database.
BIDASK	= bid-ask spread is the difference between lowest ask and highest bid divided price, by year.	CRSP	annual average bid ask quoted spread using daily CRSP data, as 100*(ASK-BID)/PRICE
RETV	= standard deviation of daily returns over the year	CRSP	standard deviation of RET (daily data) by year t.
NUMINSTOWNERS	= number of institutional shareholders	Thomson-Reuters	Number of 13-F Institutional Owners

|			
CSHR	number of common shareholders	Compustat	CSHR
INSTOWNPERC	Total institutional ownership, % of shares outstanding (13F)	Thomson-Reuters	INSTOWN_PERC
CSHRPERC	100% - x% of Shares Outstanding of Institutional Ownership		1 - INSTOWNPERC
XAD	= Advertising expenses	Compustat	XAD
NANL	= number of analysts following the firm	I/B/E/S	number of analysts follow firm at year t
RLANDOR	= Landor raking	Landor[b]	1 if firm are looked in Landor raking, otherwise 0.
DLY	= dummy year variable	Landor	1 if firm are looked Landor raking at year t, otherwise 1
D10K	= dummy for 10-K forecast information. Accounting data is obtained from SEC 10-K filings (EDGAR) merged with Compustat-CRSP database.	EDGAR/SEC	1 if word "forecast" are looked in 10-K filling's firm at year t , otherwise 0
FOG10K	Fog Index of readability of MD&A	EDGAR/SEC[c]	voluntary forecast disclosure

[a] Availabe at http://bear.warrington.ufl.edu/ritter/FoundingDates.htm.
[b] Availabe at http://www.landor.com.
[c] And availabe at Feng Li's website http://webuser.bus.umich.edu/feng.
Source: Author.

APPENDIX B: The Design of Sentiment Analysis Process in Rapidminer 5.3
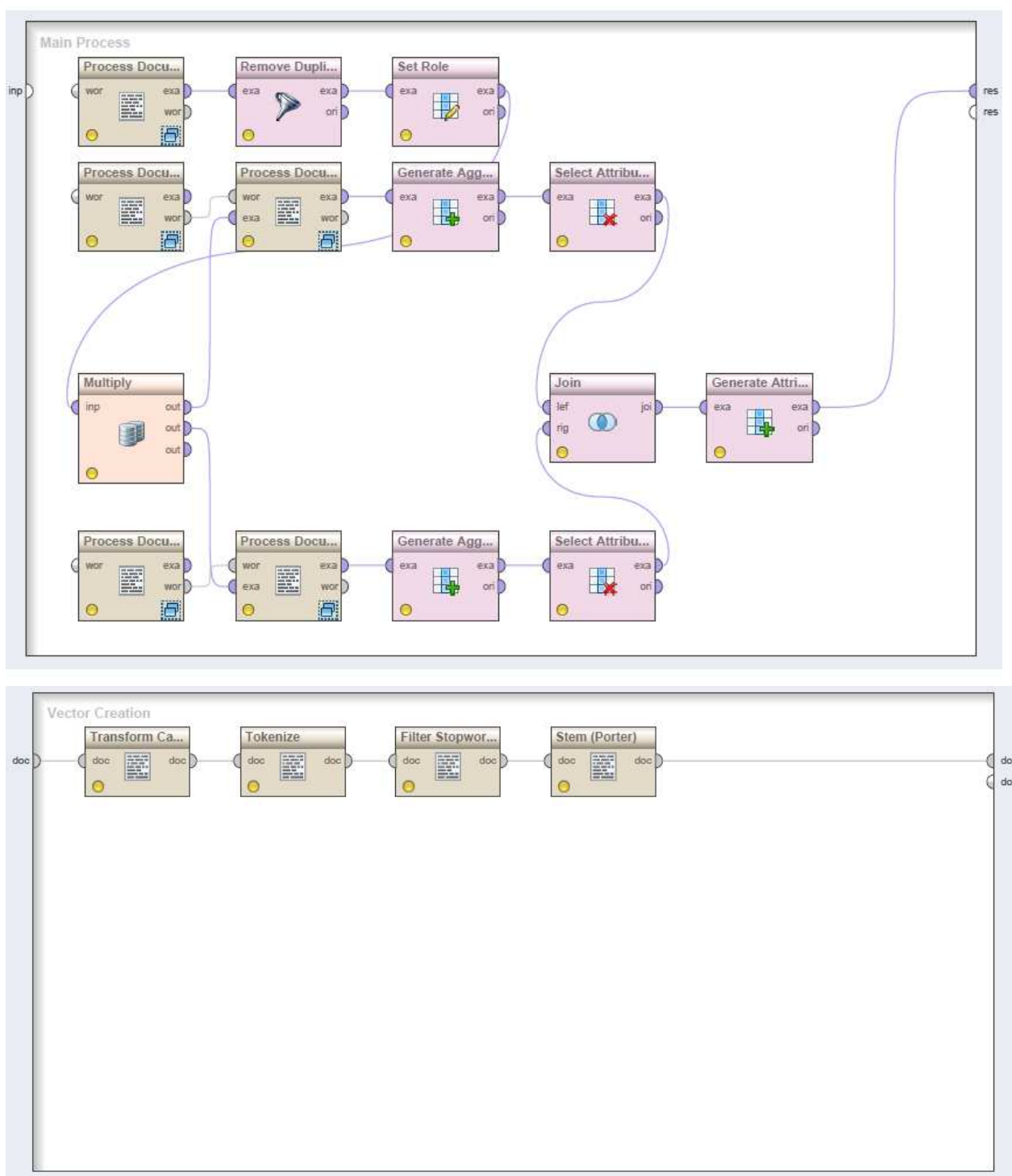
Source: Author.

APPENDIX B: The Program of Sentiment Analysis Process in Rapidminer 5.3

```xml
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<process version="6.1.000">
  <context>
    <input/>
    <output/>
    <macros/>
  </context>
  <operator activated="true" class="process" compatibility="6.1.000" expanded="true"
name="Process">
    <process expanded="true">
      <operator activated="true" class="text:process_document_from_file"
compatibility="5.3.002" expanded="true" height="76" name="Process Documents from Files"
width="90" x="45" y="30">
        <list key="text_directories">
          <parameter key="Auto" value="D:\BigData\Auto"/>
          <parameter key="Sport" value="D:\BigData\Sport"/>
        </list>
        <parameter key="use_file_extension_as_type" value="false"/>
        <parameter key="create_word_vector" value="false"/>
        <parameter key="keep_text" value="true"/>
        <process expanded="true">
          <operator activated="true" class="text:transform_cases" compatibility="5.3.002"
expanded="true" height="60" name="Transform Cases" width="90" x="112" y="30"/>
          <connect from_port="document" to_op="Transform Cases" to_port="document"/>
          <connect from_op="Transform Cases" from_port="document" to_port="document 1"/>
          <portSpacing port="source_document" spacing="0"/>
          <portSpacing port="sink_document 1" spacing="0"/>
          <portSpacing port="sink_document 2" spacing="0"/>
        </process>
      </operator>
      <operator activated="true" class="remove_duplicates" compatibility="6.1.000"
expanded="true" height="76" name="Remove Duplicates" width="90" x="179" y="30">
        <parameter key="attribute_filter_type" value="subset"/>
        <parameter key="attributes" value="text"/>
        <parameter key="include_special_attributes" value="true"/>
      </operator>
      <operator activated="true" class="set_role" compatibility="6.1.000" expanded="true"
height="76" name="Set Role" width="90" x="313" y="30">
        <parameter key="attribute_name" value="text"/>
        <list key="set_additional_roles">
          <parameter key="text" value="regular"/>
        </list>
      </operator>
      <operator activated="true" class="text:process_document_from_data"
compatibility="5.3.002" expanded="true" height="76" name="Process Documents from Data"
width="90" x="447" y="30">
        <list key="specify_weights"/>
        <process expanded="true">
          <operator activated="true" class="text:tokenize" compatibility="5.3.002"
expanded="true" height="60" name="Tokenize" width="90" x="45" y="30"/>
          <connect from_port="document" to_op="Tokenize" to_port="document"/>
          <connect from_op="Tokenize" from_port="document" to_port="document 1"/>
          <portSpacing port="source_document" spacing="0"/>
          <portSpacing port="sink_document 1" spacing="0"/>
          <portSpacing port="sink_document 2" spacing="0"/>
        </process>
      </operator>
      <connect from_op="Process Documents from Files" from_port="example set" to_op="Remove
Duplicates" to_port="example set input"/>
      <connect from_op="Remove Duplicates" from_port="example set output" to_op="Set Role"
to_port="example set input"/>
      <connect from_op="Set Role" from_port="example set output" to_op="Process Documents from
Data" to_port="example set"/>
      <connect from_op="Process Documents from Data" from_port="example set" to_port="result
1"/>
      <portSpacing port="source_input 1" spacing="0"/>
      <portSpacing port="sink_result 1" spacing="0"/>
      <portSpacing port="sink_result 2" spacing="0"/>
    </process>
  </operator>
</process>
```